AL.1.562

Inside
New Test
Center
Supplement

Volume 5, number 4
April 1984

Newsline

CANADIANA
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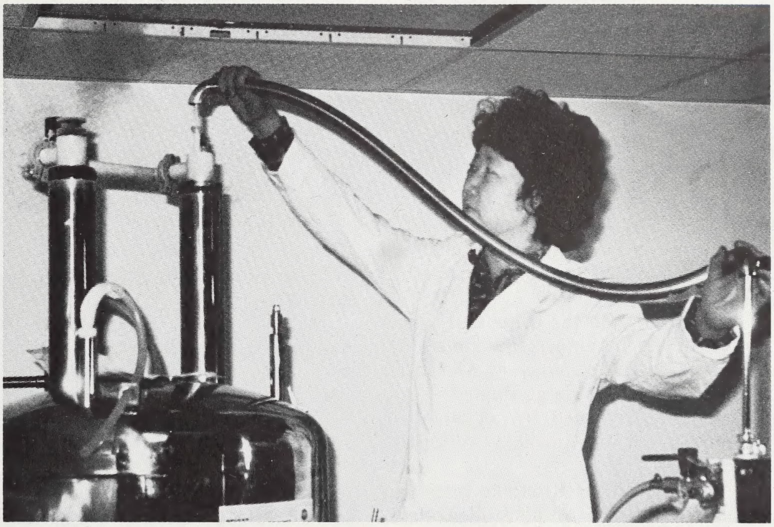
Research Council's solids NMR spectrometer a first for Alberta



Chemist Nancy Cyr fills the new solids NMR with liquid helium.

A quick trivia question — identify C3P0 and R2D2. Right — that lovable robot duo from Star Wars.

Now, can you identify CXP-200? Here's a hint — it is the Research Council's whiz, and there is nothing trivial about it.

CXP-200 is a solid-state nuclear magnetic resonance (NMR) spectrometer — the first of its type in Alberta and one of six in Canada.

Unlike the Star Wars' robots, CXP-200 stands stationary, its impressive metre and a half shiny cylinder containing the superconducting magnet kept cool by liquid helium. To conduct experiments, a mere pinch of material is put into a 1.5 centimetre plastic "mushroom", put in the probe, which is inserted into the base of the cylinder and set spinning.

Scientists then turn to a huge console with its microcomputer, display screen and plotter to program and track the results.

Although NMR spectroscopy has been used by chemists for over 35 years to measure chemical structures and bonding of elements, the technique until recently was confined to liquids and solubles. CXP-200 will give Research Council scientists their first look at the chemical bonding of common elements in solids such as coal and plant materials and what they learn from these revelations could have far-reaching effects on Alberta's major industries.

Using NMR spectroscopy, scientists hope to be able to determine the percentage of aromatic carbon nuclei, thus predicting the liquid yield of various coals, an important factor in liquefaction processes. NMR results can be obtained in a fraction of the time it now takes to get these results.

Evaluation of protein, carbohydrate and lignin in forage crops such as alfalfa by NMR spectroscopy will benefit agriculturalists. A study of aspen wood components will contribute to the understanding and utilization of one of Alberta's forest resources.

And a study of the physico-chemical properties of polymers to determine their lifespan has important implications for the plastics and related industries.

The Research Council's acquisition of the NMR solids spectrometer is due in large measure to the foresight of Dr. R. M. Elofson, Research Fellow, who recognized its potential for scientific studies.

CXP-200 has been operational for only a few weeks, but its fame is spreading and researchers interested in its performance are almost beating a path to the Chemistry Department's door with proposals.

Dr. Nancy Cyr and technologists Cheryl Goulet and Evelyn LeClair are still discovering what makes CXP-200 tick. Since the technique is so new, says Nancy, the spectrometer will be used to establish firm technical grounds for future applications.

Newsline is a monthly publication for the employees of the Alberta Research Council.

Please send all submissions
and direct all questions to
Elizabeth Page, Alberta Research
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4445 Calgary Trail South,
Edmonton, Alberta T6H 5R7

ALBERTA
RESEARCH
COUNCIL

Four staff retire from Research Council.

After a collective total of 111 years, four Research Council staff —Dr. J. D. "Jack" Campbell, Ernst Czakert, Dr. R. M. "Mac" Elofson and Dr. Speros Moschopedis — retired at the end of March. They have been part of the Research Council's unprecedented growth during the last three decades and each individually has made a lasting contribution to research and its applications.

Dr. John Campbell

Plant life in its many forms, has been the focus of Jack Campbell's career for 40 years.

His interest in the origins of plants grew out of his undergraduate studies in botany and zoology at McMaster University where he graduated with a B.A., and followed by an M.A. in botany from the University of British Columbia.

The lure of the Klondike once was gold, but to Jack, in his student days, the adventure was in collecting living plants for the National Museum in Ottawa. Although he didn't have to scale the passes on foot, he did experience something of the pioneer conditions — "I joined a Geological Survey party in 1948 where we used horses, and never saw mosquitos in such numbers before or since. You could run your hand along your arm and kill several hundred in one swipe."

Although he worked two summers for a gold mining company, he didn't see any of the gold in the ground — "they kept everyone away from that."

On his last forays into the Klondike in 1950 and 1951, he turned to the study of fossil plants, on which he based a thesis, receiving his Ph.D. from McGill University in 1952.

Jack joined the Research Council in 1953, three years before the Campus building was constructed.

"Dr. Nathaniel Grace was director and I worked under Dr. W. A.'Bert' Lang, who later became Acting Director. We had what was known as the West Lab — a strange little shambles near where the Cameron library is now and a collection of leftover military shacks on the site of the University of Alberta greenhouse."

Classification of Alberta's coal became his major assignment and for 10 years, Jack says, he and his field supervisor, Andy Bosman, (now in the Geological Survey Department) "were" the coal survey.

Since 1978 Dr. Campbell has been on the Associate Academic Staff of the Forest Science Department, University of Alberta, giving lectures on tree rings and their relationship to recent past climates.

After retirement from the Research Council he intends to continue this work and pursue his original interest in taxonomy — the classification of plants — in particular the characteristics of the wood of conifer trees, and hopes to relate conifers to coal formation in Alberta.

Ernst Czakert

Ernst Czakert, described by colleagues as having a "lively sense of chemical curiosity", began his career at the Research Council in the Coal Research Department in 1960.

Born in Leimgruben, Czechoslovakia in 1923, he survived the devastation of wartime Europe and graduated from a Czechoslovakian technical school before emigrating to Canada in 1950. He first worked for COMINCO Mines in Yellowknife and Eldorado Mines in Saskatchewan. In 1962 he returned to Eldorado for two years and then rejoined the Research Council, first in the Coal Research Department before transferring to the former Product Research and Development Department in the Campus Building.

When the Department moved to Clover Bar, Ernst moved too, as part of the analytical laboratory services group. He is regarded as an expert in the analysis of metals, total carbon analysis, molecular weight determination and spinning bands distillation, and has generated ideas for research projects.

Ernst worked on the Peace River iron ore project doing analysis for arsenic, chlorine and phosphorus.

Among his achievements, he was coauthor with Dr. Speros Moschopedis on a patent issued in 1970 on Solubization of Humic Acids, Lignites and Coals.

Dr. Mac Elofson

Dr. Elofson also began his career at the Research Council in the Coal Department under W. A. Lang. The year was 1953, and Dr. Elofson, who earned his B.Sc. from the University of Alberta (1941) and a Ph.D. from the University of Wisconsin (1944), had already spent more than 10 years in private industry.

In that period, he cemented his ties with his roots, taking over his father's farm in Ponoka. His dedication to farming and his brilliance as a scientist, coupled with his outspokenness, proved a potent combination, leading to imaginative and original scientific investigations and applied agricultural research.

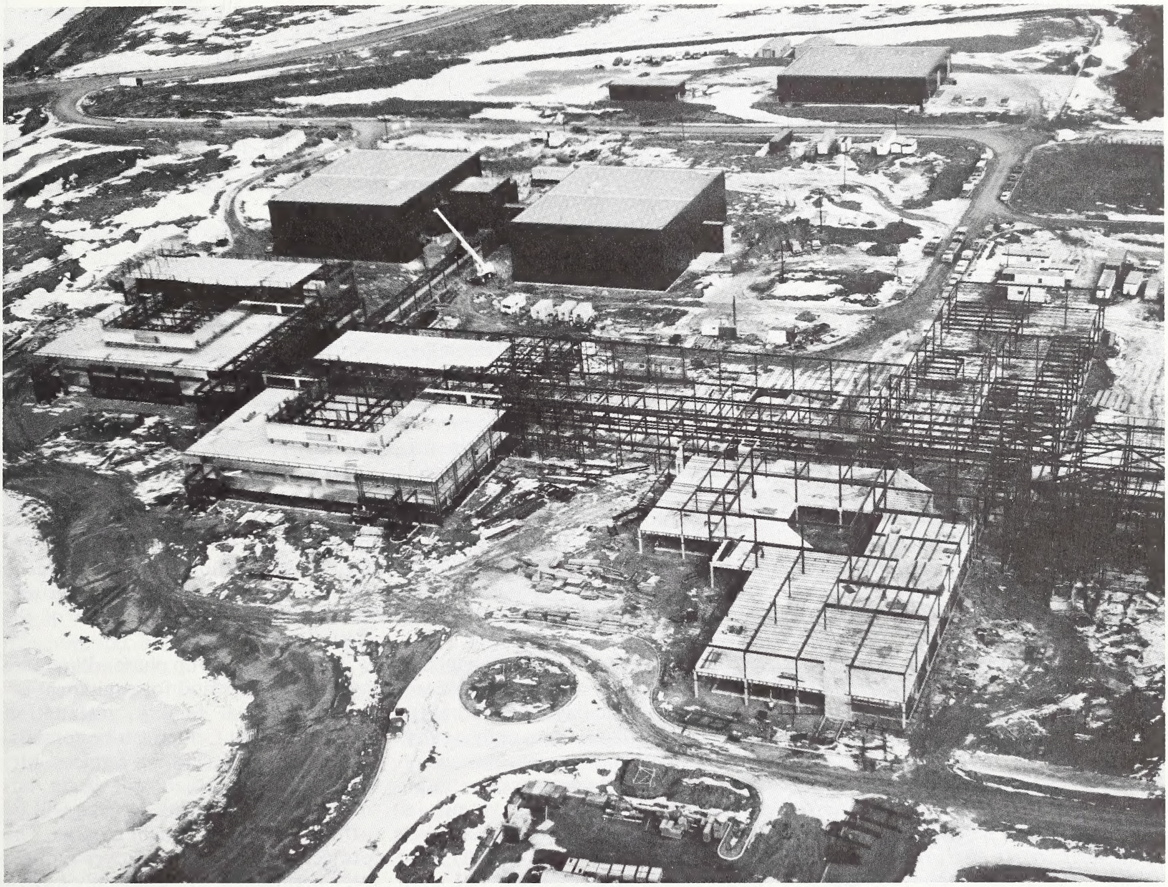
He has led one of the few active Canadian groups doing polargraphy, electron spin resonance and organic electrochemistry. Hail, cattle feed, nitrogeneous fertilizers, silage and fossil fuels have been areas of study or development. Practical everyday problems were translated by Dr. Elofson into areas of research — for example, his proposal in 1955 that the Research Council study hail formation and ways to reduce it were directly related to Mac Elofson, farmer.

In 1961, he formed the Special Projects and Microbiology Department, acting as Department Head until 1980, when he resigned to devote more time to research. More recently, the Research Council's acquisition of the new solids NMR in the Chemistry Department is due in large part to Dr. Elofson's recommendations.

Three years ago, as recognition by his colleagues of his valuable contributions to science in the 28 years he had then served with the Research Council, Dr. Elofson was appointed Research Fellow.

Supplement Newsline April 1984

New Test Center will be located in Research Council Mill Woods complex



This aerial view taken in early March shows progress on the construction of the Research Council complex at Mill Woods. The twin blocks closed in are the high head laboratories. A crane points to the one at left which will house the new electronics product Test Center. The other high head lab will be shared by the Biotechnology Department and Industrial and Engineering Research Division.

The Alberta Research Council has been selected to develop a $10 million electronics product test center within its new complex now under construction in Mill Woods.

The announcement was made March 13 by Hon. Hugh Planche, Minister of Economic Development. Funding for the establishment and initial three years of operation of the Test Center, the first of its kind in western Canada, will come from the Alberta Heritage Savings Trust Fund.

A survey of Alberta industry indicates some 20 companies are spending approximately $500,000 annually in product certification activities. With about 100 small- to medium-size electronics product manufacturers already established in the province, it is estimated the testing business will increase to $1 million annually as Alberta's fledgling electronics industry gears up their products for competition in world markets.

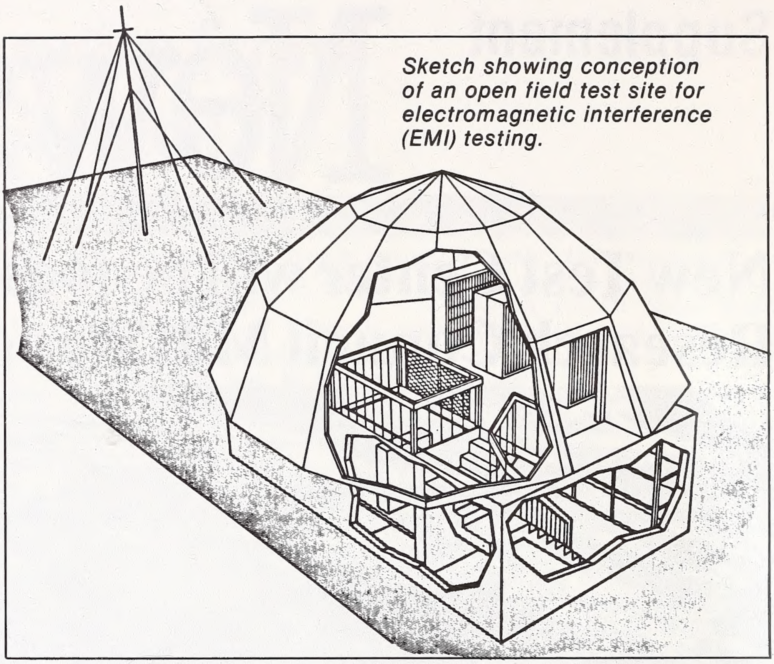
"The Government of Alberta is committed to assisting development of industries that will be competitive in international markets," Mr. Planche said. "For this reason, the facility will be a world class center."

The government's decision came in response to an industry survey and business plan prepared by the Alberta Research Council with assistance from Bell Northern Research. Funding for the study and proposal was shared by the Research Council and Alberta Economic Development.

"The Alberta Research Council warmly welcomes this development," said Dr. Robert W. Stewart, President. "The Center will be of great service to a rapidly growing sector of private industry. Siting it with the Research Council will further strengthen the relationship between the Research Council and the private sector."

> *"The Center will be of great service to a rapidly growing sector of private industry. Siting it with the Research Council will further strengthen the relationship between the Research Council and the private sector."*
> *— Dr. Stewart*

The Test Center will occupy 24,000 square feet of space in the new Research Council building to house laboratories to conduct testing for product safety and integrity evaluation; functional testing for product performance verification; terminal attachment verification; walk-in chambers for environmental and electrical noise susceptibility. Another 100,000 square feet of adjacent land will be designated for an open field test site for electromagnetic interference testing.


Sketch showing conception of an open field test site for electromagnetic interference (EMI) testing.

BELL NORTHERN RESEARCH

"Industry really needs this facility," says Peter Williams, Head of the Industrial and Engineering Research Program Development Group at the Research Council. "There are no such facilities in western Canada and manufacturers must ship their products for testing to eastern Canada which means delays and extra costs. If Alberta is to penetrate and compete in Canadian and world markets, particularly in the growing technologies, manufacturers must have the means for developing credible products which meet international standards."

The Test Center is being designed to open all the doors to product acceptability. Mr. Williams stressed that the Test Center will provide a unique range of services in design, pre-production and production stages as well as testing services for certification to various international standards such as Canadian Standards Association (CSA) and Underwriters Laboratories (UL). In addition, the Test Center is expected to include some research and development work applicable to unique Canadian conditions.

The Alberta Research Council's established international reputation, the dollar savings in being part of the new complex, and its proximity to Bell Northern Research and the proposed CSA facility in the Edmonton Research and Development Park, contributed to Cabinet's decision. Bell Northern Research operates a similar testing facility in Ottawa and will provide essential expertise and training during the initial development of the project. The Alberta Electronics Industry Association also has made a commitment to provide key experienced personnel for the duration of the Test Center start-up.

The initial start-up phase will require a preliminary period for equipment acquisition and facility installation before the Test Center can be commissioned for full operation services. Mr. Williams said design will begin immediately and priority services will be offered within six to eight months. The project will be phased in over a three-year period and will ultimately have a staff of close to 50, most of whom will be engineering and technical people.

Preliminary revenue estimates indicate the Test Center operation could become a self-supporting business by the end of the third year of operation.

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ALBERTA
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Dr. Speros Moschopedis

In the beginning, it was curiousity and a desire to gain experience in the petroleum industry. Then Speros Moschopedis, an honors B.Sc. graduate in Chemistry from the University of Athens, heard a radio announcement that Canada needed chemists.

In 1956, Dr. Moschopedis found himself working as a research analyst with a nickle company, Sherritt Gordon Mines Ltd. in Fort Saskatchewan. A year later, he moved to the Research Council as a Research Officer, where he has spent "a challenging and rewarding" 28 years.

The only break in that time was in 1969 when he returned to the University of Athens to acquire a Ph.D in peptide synthesis.

His career has been a productive one, with more than 80 publications and eight patents, most related to oil sands or coal and humic acids.

In 1965, after being granted his first patent, Dr. Moschopedis received the designation of Inventor by the Canadian Patents and Development Limited.

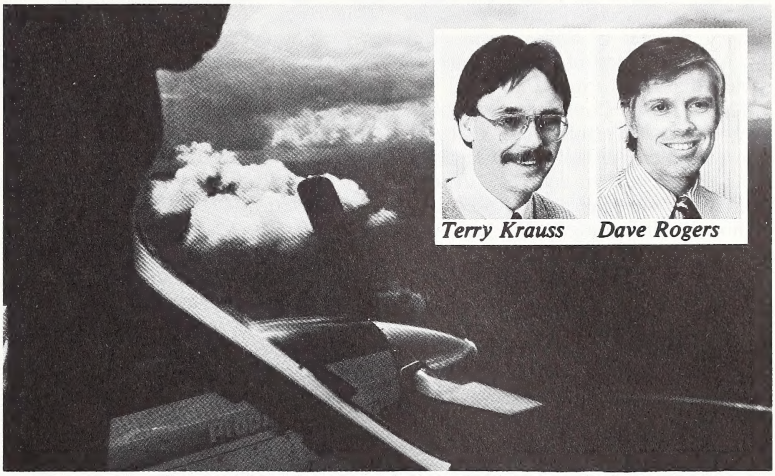
Ten years later, Dr. Moschopedis saw another of his patents, involving humic acid formulae for commercial drilling-mud thinner, licensed to T.I.M. Corporation of Houston, for commercial exploitation.

Last year he was the first Canadian to receive an award from the Japanese Science and Technology Agency to work in Tokyo on an exchange program.

On the threshold of his retirement, Dr. Moschopedis has been awarded another patent for a new concept involving the production of synthetic fuels by co-processing bitumen (and bitumen-derived liquids) with coal. He now throws out the challenge to other scientists and engineers to bring the concept closer to commercial reality.

Nearly 30 years ago, Dr. Moschopedis intended only to stay in Canada for a short period before returning to Greece. Three decades later, he says he might just do that, although his family ties will keep bringing him back here.

Those daring young men in their flying machine



When the engine failed Terry Krauss took this photo of the idle propeller of the research aircraft at 12,000 feet altitude.

Most cloud physicists sit at computer terminals, looking at simulated clouds, but Terry Krauss and Dave Rogers of the Atmospheric Sciences Department, get a first-hand view of the real thing.

As part of the Hail Project team, these young cloud physicists spend hundreds of adrenalin-charged hours hurtling aloft in the research aircraft in the quest for the data they need in weather modification research.

They don't admit to "nerves of steel," but Terry and Dave agree that directing cloud seeding experiments from the co-pilot's seat of the Conquest propjet requires certain attributes — presence of mind, quick decision-making and most important of all, the ability to assimilate information and communicate effectively between the pilot and ground controller.

"There's a lot of intense activity and the cloud isn't going on hold," says Dave.

"There are ways to direct a mission without explaining what you want to do next because there isn't time for discussion or compromise," explains Terry. "You have to be informed and have a concept of what's happening at all times. You can't just stop and say let me think when you're flying around at 200 mph. You have to know when to turn and keep one step ahead of the situation."

Terry describes flying on the edge of a storm like being "a kernel in a corn-popper." The turbulence commercial aircraft passengers sometimes encounter is magnified a hundredfold — it is not unusual for the research aircraft to pull negative G.

Actual flying is the job of the INTERA pilots (INTERA Technologies Ltd. owns and operates the research aircraft), although both scientists have spent enough time in the co-pilot's seat to have learned something about handling the plane in case of emergency. Last summer, when an engine failed during one of Terry's missions, he read the emergency airstart instructions while the pilot fired the engine back to life.

"Those three minutes passed like 30," says Terry, who allows that "it's okay to be nervous."

"But there is no room for overreaction or panic — that's unacceptable and dangerous," he emphasized.

Dave points out that their missions don't take them through the worst part of storms — they are on the periphery looking for the developing, not decaying stages as they seek the earliest growth of ice crystals.

Researchers around the world have been studying hailstorms for years. In Alberta, hail is the bane of farmers, causing millions of dollars in crop

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damage annually. In 1981, the $100 million damage one hailstorm did in Calgary rates as Canada's worst natural disaster in dollar terms, and last summer, Edmonton experienced a devastating hailstorm.

The Research Council's mandate to study clouds has resulted in a wealth of information about hail and rain and to some extent how to control hailstone formation through cloud seeding. Although eliminating hail is unlikely, the chances of reducing it are better.

But, Terry says "there are still questions to be answered — and in using the research aircraft, we can get better information, filling previous gaps. Our job is to make sure we have quality data as opposed to data with no focus in mind."

During the winter months Terry and Dave trade their action-packed days for computer terminals and desks as they spend their time deciphering and interpreting the collected data.

As for passenger travel on a commercial aircraft, they both summed it up in one word — "dull."

Employee changes

We welcome the following people who have joined the Research Council:

Donna Highet, Research Technologist, Atmospheric Sciences Department; **Karon Tolonen,** Information Specialist, Industrial Development Department.

We wish the following well in new endeavours:

Merle Blachut, Chemical and Material Management; **Dr. Jack Campbell,** Coal Research; **Ernst Czakert,** Oil Sands Research; **Dr. R.M. "Mac" Elofson,** Chemistry; **Stephen Goff,** Geological Survey; **Wraye Leskiw,** Oil Sands Research; **Dr. Speros Moschopedis,** Coal Research.

Corporate Challenge: it's sign-up time

It isn't the Olympics, but it is a challenge — the Edmonton Corporate Challenge.

Corporate Challenge '84 will be held Saturday, May 12 from 8:30 a.m. to 4:30 p.m. at the Universiade Pavilion.

If you wish to participate, contact Stephanie Wilson or Jan Logan at the Occupational Health Unit (438-1666). The entry deadline is April 25, with the Occupational Health Unit putting up the $100 entry fee per team.

The Research Council can have two teams of up to 15 members each, five of whom must be females.

The Edmonton Corporate Challenge has been developed to encourage participation in management and employees throughout the Edmonton area. Events include the Bureaucratic Shuffle, the Executive Strut and the Better Business Obstacle Course. Other events are the six kilometre run, target toss and the pass the buck relay.

If you can't go for gold in 1984, why not just go for fun and fitness?

Dr. English invited to present paper

Dr. Marianne English, Section Manager in the Atmospheric Sciences Department, is one of 20 people invited to present papers at a workshop on precipitation enhancement organized by the American Meteorological Society in Salt Lake City, May 23-25.

Dr. English will be discussing "A comparison of Silver Iodide and Dry Ice Seeding Effects."

At the invitation of Dr. Alan Vanterpool, Director of the Office of Science and Technology for Alberta, the heads of Canada's leading scientific bodies in Ottawa visited Alberta for a first hand look at research and development activities in the province. In this photo, Dr. Peter Tremaine explains some of the work at the Oil Sands Research Department for Dr. Louis Berlinguet, Secretary of the Ministry of State for Science and Technology; Dr. Stuart Smith, Chairman of the Science Council of Canada; and Dr. Gordon MacNabb, President of the Natural Sciences and Engineering Research Council of Canada. Dr. Jan Boon, of the Oil Sands Research Department looks on. Dr. Larkin Kerwin, President of the National Research Council, joined the tour later.

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Volume 5, number 5
May 1984

Newsline

Important how others see Research Council - *Dr. Stewart*

CANADIANA
MAR 14 1985

The Research Council must be seen as a competent, purposeful organization that knows what it is doing ... and must give people a sense of responsiveness and responsibility.

That is the essence of a message for Research Council staff from Dr. Robert Stewart, President, contained in a recent interview for *Newsline*.

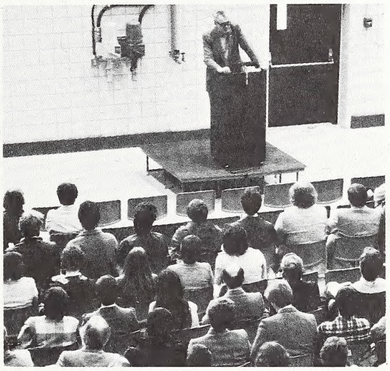
"Staff should remember that we are almost entirely funded by the province and the future of the Research Council depends on the population and politicians feeling we are making good use of those funds ... the nature of an impression of any person having contact with the Council is important to us. The way in which staff behave is going to affect people's opinion of the competence and responsibility of the Council."

He said the "notion of qualitative upgrading" had been conveyed to him in accepting the Presidency and he affirmed the Research Council "could be better." But he added he was "personally not great on reorganization unless for a very good reason."

"A moderately good organization working smoothly, that everyone understands, is better than a superb organization no-one understands."

In assessing the present organization, Dr. Stewart said the Research Council has an enormous amount of technical ability and some scientific ability with "competent people." Compared to major university faculties, he suggested the Research Council is "not notably strong scientifically ... we are not going to attract world attention with existing staff."

While he said it is not his ambition to fill the Research Council with distinguished scientists, he would like to see up to five top flight scientists "to leaven and lighten" the work, enhance the Research Council's dealings with the universities and act as a stimulus to the rest of the staff.



Dr. Stewart addresses staff.

> *"The strength of the organization is correctly technical and our basic mission is applied science."*

"The strength of the organization is correctly technical and our basic mission is applied science," he said. "Our main place of work is with the private sector and we have to build on our reputation of being a solid, competent, reliable place that can assist small- and medium-size companies raise their competence to contemporary standards."

While no decision has been taken, Dr. Stewart said the Research Council must have a Calgary presence — "I believe some substantial industrial assistance could operate there." He estimates somewhere between 20 and 50 people will be working in Calgary by 1985.

He is examining the intended move to the new Mill Woods complex, with a view to completely vacating Terrace Plaza next year.

"We may have to put in another mezzanine at Mill Woods and squeeze people up a little bit, but it is all part of the downsizing of government."

Dr. Stewart believes the organization will be more efficient under fewer roofs and he favours a "leaner operation that should cut operating costs and improve internal communications."

"The essential change is that we can no longer look to the growth once anticipated. The climate has changed enormously and we probably will not acquire a lot of additional people," he said. "That is not to say growth won't occur, but when it does it will be a different kind and the timing will be quite different."

Speaking of research in a broader context, Dr. Stewart observed "the world is changing very fast and if we are not in some way part of that change we will get left behind. Being left behind is not a very satisfying state, nor do I think it is the wish of the majority of people in this province to see the world move by and ahead of them.

"We should be trying to do the best we can and remain adaptable so we can accommodate a lot of different futures ... to get ourselves tied up with one particular view of the future is almost certainly a formula for disaster."

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ALBERTA
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revised April 1984

Radiation safety consultant hired

For the past ten to twelve years, the Radiation Control Committee for the University of Alberta has been providing radiation safety support for the Alberta Research Council.

The use of radioactive materials and radiation emitting devices within the Research Council has shown a steady increase over the years. A recent recommendation by the Atomic Energy Control Board has resulted in the Alberta Research Council taking over responsibility for the radiation safety of its employees and steps have been taken to apply for a Radioisotope Licence.

Stuart Hunt and Associates, Occupational and Radiation Safety Services Limited, has been engaged as Radiation Safety Consultant to develop the program and to provide ongoing radiation safety advice on behalf of the Alberta Research Council.

Within the next month, researchers holding University of Alberta Radioisotope user permits will receive permits issued under the authority of the Alberta Research Council Consolidated Radioisotope Licence.

Researchers interested in obtaining a Radioisotope User Permit or who have questions concerning radiation safety are to contact Mr. E. J. Parranto, Safety, at 438-1666.

Board to meet in Lethbridge

The Research Council's Board of Directors will hold its next meeting June 1 in Lethbridge.

The Board will host a luncheon for members of the Lethbridge and area business community, when Dr. Robert W. Stewart, President of the Research Council, will be the speaker.

A preview of what's coming — Kanwal Lali and Maria Holuszko prepare for the Coal Research Department's move to new quarters in the Coal Research Center at Devon. More than 1,000 cartons of laboratory equipment worth $2 million plus another 200 cartons of office equipment must be packed and transported from the Campus Building this month.

Graphic Services - focus for everyone

When anyone needs maps, photos or other illustrations, they see Wally Hutniak, Manager of Graphic Services. Last year, Wally's Department had 600 requests — actually more than that, when open accounts are tallied, says Wally.

"Basically everyone uses our service," he explains, and the variety of requests, from a simple diagram to complex cartography keep his technical staff of 13 people constantly busy. The Oil Sands and Coal Research Departments each have an on-site draftsman working with the scientists to provide working plans for the installation, operation and documentation of equipment.

The most time-consuming work is cartography. The Athabasca Basin Geology map took 70 hours to complete, with revisions consuming 17 hours in 1982, and further revisions in 1983 requiring 35 hours. But the most labour intensive and costly are multicolour maps which require between 300 and 600 man hours each.

The biggest area of demand is for slides used for presentations and conferences. Often these requests must be dealt with in a tight time-frame, says Wally, and while there are different types of slides, he stresses the department strives to keep to a uniform standard.

"We take on inhouse work private firms wouldn't touch, and provide a convenience for a variety of jobs," he says.

One only has to take a look at the numerous Research Council publications from the technical reports to brochures to appreciate the quality of the work done by Wally's team.

Photographer John Gertz demonstrates new copy camera, used mainly for PMT and graphic line work, while technologist Diane Vandal is shown making blueline prints of maps.

Spring breakup - a non-event

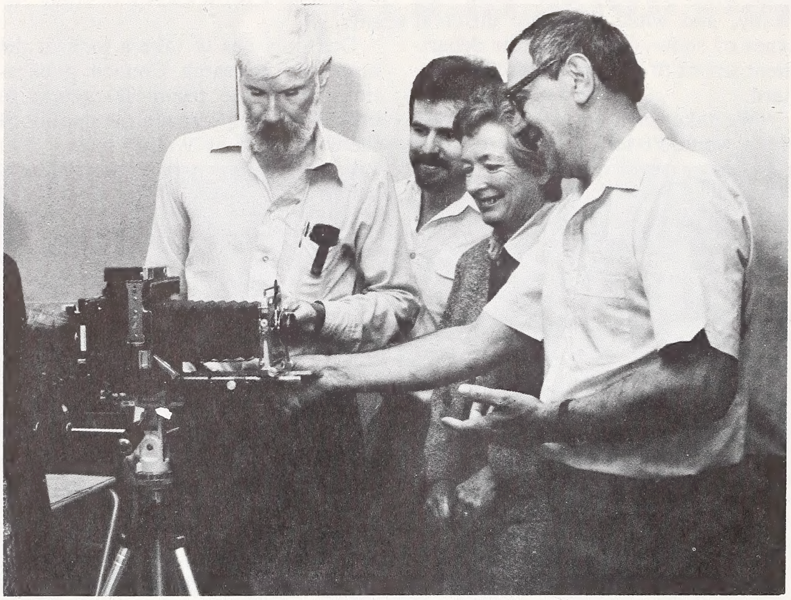
For the first time in 17 years, the Civil Engineering Department's seasonal ritual — watching spring breakup on Alberta rivers — turned into a non-event.

The Civil Engineering Department has two full-size load measuring devices on the Pembina and Athabasca Rivers, the only such fully instrumented sites in North America. The objective has been to determine the accuracy of the Canadian code for designing bridge piers to resist ice forces.

To get the necessary documentation, the field crews camp out, waiting round the clock for days — even weeks — poised to turn on their lights, cameras and equipment at any time of the day or night when the ice begins to move.

This usually dramatic sequence didn't materialize this year. With little snowpack over the winter and so no runoff to raise the ice sheet to get it moving, what ice was left rotted in place. An aerial survey conducted in early April showed that the crews had nothing to measure.

Leslie's photo seminars click



Don Scafe, Dieter Steigerwald and Joan McMeeken get some pointers from Research Council photographer Leslie Lorinczi during the popular Monday night sessions he conducted.

If you don't know an f-stop from a bus stop you missed a golden opportunity this spring. If you do know the difference you still missed the many valuable photographic tips Leslie Lorinczi of Graphics Services passed along to about 15 staff members who attended his late Monday afternoon seminars.

Using a profusion of photographic color slides to illustrate points such as depth of field, construction of lenses, and the colors that constitute white light, Leslie clearly illustrated the fundamentals of photography for the beginner. In addition, he consistently added helpful tips for more advanced photographers. Practical experience was provided during studio sessions using Polaroid film to allow "instant" assessment of success or failure at making the photograph visual in the mind's eye. For the "final" practical session each student took a 20-exposure film and tried to photograph part of the world as they see it. Leslie's constructive critique of each anonymous photographer's slides should improve the picture taking ability of each pupil.

The enthusiastic response of the participants suggests that they will be first in line if further instruction is available in the fall. We'll be watching for it!

Manual changes

Administration - Project Approval - ADM-235-5
Finance - Subsistence and Travel Allowance - FIN-300-1 to 6
Finance - Retirement Functions - FIN-311-1
Human Resources - Research Officer Classification (Guidelines) - HUM-434-1 to 8
Human Resources - Out of Country Medical - HUM-480-120 to 122
Human Resources - Reduction in Force - HUM-545-1 to 3
Public Relations - Public Relations Unit - PR-720-1 & 2

Employee Changes

We welcome to the Research Council:

Dennis Ward, Assistant Research Officer, Biotechnology.

We wish the following well in new endeavours:

Christine Wright, Oil Sands Research.

Next holiday is May 21.

Jamey Hovey wins chemistry prize

Jamey K. Hovey, of Fredericton, a student at the University of Waterloo, has been awarded the Borden Chemical Prize for the best term chemistry report.

The report, "Heat Capacities and Volumes of Various Substituted Benzene Sulphonic Acid, Sodium Salts," was based on work Jamey did last year at the Oil Sands Research Department with Dr. Peter Tremaine, Dr. Ian Tasker and technologist Kim Sway.

Jamey, a third-year honors chemistry student, has returned to the Research Council for another eight months under the University of Waterloo's co-op program in which students spend time working directly in industry or research organizations.

Ed Phillipchuk named adjunct professor

Ed Phillipchuk, food and agriculture technology specialist with the Industrial Development Department, has been appointed to the position of Adjunct Professor in the Department of Food Science, University of Alberta.

Mr. Phillipchuk will be lecturing to fourth year and graduate students. According to Dr. Frederick Wolfe, Chairman of the Department of Food Science, Mr. Phillipchuk is the main link between the Research Council and the Department of Food Science, serving an important role in liaison, and bringing the two units together to employ both basic and applied research to solve problems for the local food industry.

AL A582

Volume 5, number 6 June 1984

Newsline

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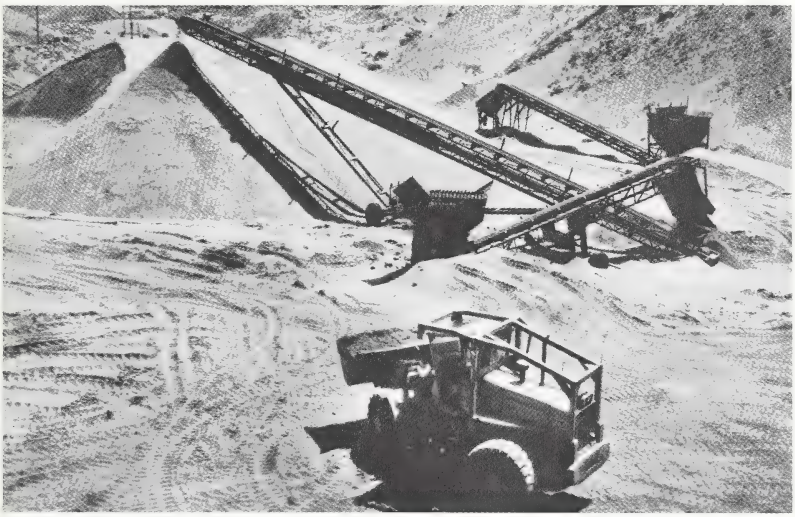
Aggregate inventory maps vital provincial resource



Digging into one of Alberta's important resources near Medicine Hat

Aggregate — sand and gravel — just doesn't have the charisma of black gold.

But, as Dixon Edwards of the Geological Survey Department points out, this low-profile commodity is every bit as essential as oil. Without aggregate, modern construction in buildings, roads and bridges would come to a screeching halt. In fact oil sands development itself depends on this material. Dixon estimates an oil sands development in the construction phase over five years would consume up to 50 million cubic metres of sand and gravel, twice the amount used by the rest of Alberta in one year.

Aggregate doesn't command much public interest yet and the importance of its location, quality and reserves has escaped notice until fairly recently. That appears to be changing. Ontario's aggregate policy is currently the subject of controversy in that province, and Dixon says Alberta could eventually face some of the same land use issues. He points out that Alberta's production of sand and gravel is second only to Ontario, and while that province's production has been declining, the latest statistics indicate Alberta's production has not experienced the same decrease despite the change in the economy.

Last month, at the request of the Non-Renewable Resources Study Group of the Public Advisory Committees, Environment Council of Alberta, Dixon gave a two-hour presentation outlining the aggregate resource, with projections on immediate and long term impacts of resource use in terms of land disturbance and cost to the public due to sterilization.

For the past eight years Dixon Edwards has headed the Geological Survey Department's Aggregate Inventory, a joint project with Alberta Energy and Natural Resources, initiated when it became apparent that sand and gravel information was seriously deficient in the provincial Natural Resource Data Base. More than 600,000 acres of potential sand and gravel resources have been mapped in the areas surrounding the highly populated centers — Edmonton, Calgary, Lethbridge, Medicine Hat, Grande Prairie and Lloydminster.

Because aggregate is a surface resource, it can be the center of land-use conflicts, says Dixon. Such was the case in the Canmore Corridor, a scenic area containing aggregate needed for Eastern Slopes and Kananaskis tourist development.

"Our input was used when the land-use decisions creating the Eastern Slopes policy and determining the Kananaskis border were made," says Dixon. He explains the emphasis of his work is on economic analysis, helping planning authorities at all levels of government.

"We make a real effort to provide a service and we have a good record of responding to inquiries."

continued on page 2

Newsline is a monthly publication for the employees of the Alberta Research Council.

Please send all submissions and direct all questions to
Elizabeth Page, Alberta Research Council, 7th Floor, Terrace Plaza,
4445 Calgary Trail South,
Edmonton, Alberta T6H 5R7

ALBERTA
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continued from page 1

Field work is literally from the ground up. Deposits are delineated, examined for quality and reserves, and the data produced in reports and maps — "we try to make our reports highly usable for those who need them," says Dixon.

Priority regions are those with concentrated high populations or with mega projects such as highway twinning and oil sands development.

Sand and gravel isn't everywhere, Dixon observes, and the further it must be transported, the higher the price tag.

Just as paved-over farmland is lost forever, so aggregate deposits, once zoned out of use, cannot be recovered.

"We are attempting to project aggregate usage over the next 20 years. The planning decisions made now will affect people for generations to come," says Dixon. "Through our aggregate inventory, we can help planners protect an important nonrenewable natural resource."

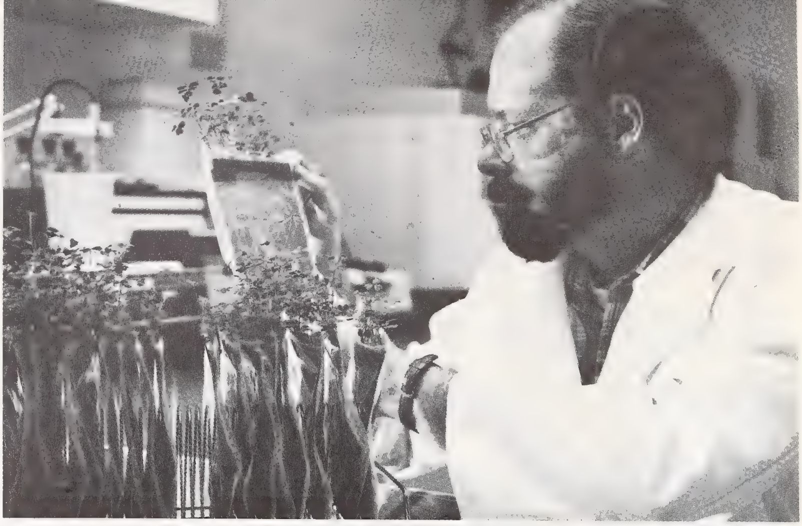
Project team head arrives

Bell Northern Research engineer David Kaing has arrived from Ottawa to head the BNR project team responsible for the engineering component of the proposed electronics product test center. Mr. Kaing will be working closely with the Research Council's Industrial and Engineering Research Division in the development of the test center.

BNR, which participated in the original concept and development plan, will continue its involvement in the design and construction of the test center to be housed in the Research Council's new complex in Mill Woods.

Peter Williams, Head of the Industrial and Engineering Research Program Development Group, says a project team is being recruited, design work is underway, and capital equipment is being detailed.

The Research Council is following a "contract out" strategy for procuring consultant studies related to marketing, business development and the establishment of administrative systems.



Dr. Walter Leps checks plants innoculated with soil samples. The plants do the work, selecting the Rhizobium from the soil which leads to nodulation.

Out of the field, into the lab —looking for "superior bacteria"

"The real detective work comes when a bacteria is found,"

Decreasing natural organic matter in prairie soils poses a serious problem for prairie farmers, and they are increasingly reliant on chemical fertilizers and manufactured bacteria or Rhizobium innoculants to stimulate nitrogen-fixation to produce vigorous legume crops.

Alberta Research Council microbiologist Dr. Walter Leps says "good nodulation is a numbers game. The more bacteria that are alive and healthy, the better the innoculant at planting time."

A team of biotechnology scientists at the Alberta Research Council is embarking on a large-scale project to find the elusive bacteria which can be turned into a commercially viable Rhizobium innoculant tailored for local needs.

The problem for the scientist is to isolate different Rhizobium strains present in the soil and identify the one best able to create the nitrogen-fixing nodules. What complicates the scientific detective work is climatic factors.

Dr. Leps explains it is not just a matter of isolating the bacteria, but finding the one which is low temperature tolerant that can be adapted to Alberta's particular soil and climate conditions.

"There are hundreds of different bacterial strains — we can isolate 10 strains from one soil sample and there is no way to tell just by looking at them which one could do the job."

Getting the project under way has been literally spadework for Dr. Leps, who spent last summer digging in wild alfalfa fields to collect both plant and soil samples for testing.

Since there is no guarantee that what works at low temperatures will also fix nitrogen at "normal" temperatures, Dr. Leps says the laboratory research to be conducted on any strains must be done at both low and moderate temperatures.

"The real detective work comes when a superior bacteria is found," says Dr. Leps. "That's when we ask what makes it superior genetically, physiologically and biochemically."

Once laboratory sleuths like Dr. Leps have the answers to these questions, he believes they can manipulate the bacteria in the test tube to produce the desired results which could lead to commercial manufacture.

Detective work — Al Howard demonstrates an electromagnetic inductance rod, a new tool for determining the presence of saline salts without disturbing the soil

Help on the way for prairie soils

Getting to the root of the problem is Al Howard's assignment and to do that he carries with him an EM 38.

Al is one of the team of researchers investigating and identifying areas of Alberta under attack by soil salinity.

The ravages of prairie farmland from salinization cost an estimated $250 million annually and there are predictions that the province's half-million saline-affected acres could double by 1994.

Early identification of salinity in the soil is critical to reclamation and proper land management. Soils Department Research Officer Al Howard says his EM 38 — an electromagnetic inductance rod — may be an important weapon in the fight to preserve the province's agricultural base.

The rod induces a current flow in the soil determining the presence of high or low conductivity zones below the earth's surface, roughly corresponding to the depth of rooting activity. The electrical conductivity of soil is influenced by a number of factors, including texture, moisture content, soil temperature, and the concentration of dissolved salts in the soil water. Where the other factors are relatively uniform, soil salinity detected by the EM 38 can be related to standard soil salinity values from controlled laboratory analysis of core samples.

With the EM 38, says Al, soil salinity determination is faster and can be obtained with minimum disturbance to crops.

He will be using the EM 38 this summer to take measurements in three projects where core samples for laboratory analysis will also be gathered. The objective is to establish a relationship between the two techniques to provide a reliable database for future reference.

"It is an ambitious idea, but we have to begin somewhere," he says.

More research into the plight of prairie soils affected by soil erosion is essential, a recent Senate Committee hearing in Edmonton was told. The Prairie Farm Rehabilitation Administration conducting soil surveys in southern Alberta estimates prairie farmers stand to lose billions of dollars if such ravages as erosion go unchecked.

The Alberta Research Council, with matching funding from Alberta Agriculture's Farming for the Future program, is embarking this year on a five-year proposal for study of soil erosion in east central Alberta.

"I see evidence erosion is occurring to a greater extent than most people think," says project leader Bob Howitt, Soils Department.

The counties of Beaver and Two Hills have been selected for erosion studies because they contain landscapes representative of the entire region, and recent soil surveys of the counties provide a strong information base for assigning potential erodibility rates.

"It is very important that preliminary estimates of soil erodibility be validated by field measurements," says Bob. A number of study sites will be selected for detailed measurement of soil erosion due to rainfall and redistribution of topsoil.

Soil erosion studies are being conducted in the Peace River region and in southern Alberta by Agriculture Canada, the University of Alberta and the Prairie Farm Rehabilitation Administration. The Research Council's project is the first to address the east central region.

The techniques for controlling erosion have been known for decades, says Bob, but conservation practice costs real dollars and it has not been demonstrated it is necessary in east central Alberta.

"We don't know how much erosion is occurring, but when the topsoil is gone the damage is done."

Dr. Sat Parkash, of the Coal Research Department, has been elected to the Senate of the University of Alberta. Dr. Parkash is the first Research Council staff member to serve on the senate. His three-year term starts July 1.

Employee changes

We welcome the following to the Research Council:
Bob Madill, Manager, General Accounting, Financial Services;
Rosemary Ravindra, Technologist, Biotechnology.

We wish the following well in new endeavours:
Debbie Betz, Financial Services; **Betty Coughlan**, Groundwater; **Karen Geib**, Biotechnology; **David Hall**, Editing; **Pat Hoffman**, Financial Services; **Bruce Rout**, Oil Sands Research; **Laura Williams**, Oil Sands Research.

Next holiday is July 1.

Deadline for dental claims

If you have dental claims from April 1, 1983 to March 31, 1984, please note all claims must be submitted to Pay and Benefits by June 30, 1984 or they will not be considered for payment by Northern Life.

Human Resources to host meeting

The Research Council's Human Resources Department will host the first two-day conference of provincial research organizations on human resource issues June 13 and 14. The meetings will be held at Terrace Plaza and Don Peckham, Director of the Research Council's Human Resources Department, will act as chairman.

Human resource representatives from eight provincial research organizations and the National Research Council are expected to participate in the information exchange and discussion of common problems.

Dr. Christison sole delegate

Dr. Tom Christison, Manager of the Transportation Section, Civil Engineering Department, had the distinction of being the sole Canadian delegate to an international study of pavement instrumentation held in Nardo, Italy, in April.

The two weeks of tests were conducted under an Organization for Economic Cooperation and Development (OECD) Road Transport Research Program to evaluate various systems for measuring the dynamic response of pavements (stress, strain, deformation) under heavy freight vehicles.

Dr. Christison was nominated by the Roads and Transportation Association of Canada, in recognition of the Research Council's leading position in this field. The Research Council has been conducting similar studies in Alberta since the mid-seventies and Dr. Christison has directed the program for much of its duration.

Accompanying him to Nardo was research technologist Len Chase who also has contributed to much of the work done in the Research Council's program.

Recent reports

The following is a list of recent published papers by Research Council staff available from Publications Sales, 5th Floor, Terrace Plaza:

Solutions at elevated temperatures and pressures; by Peter R. Tremaine and William L. Waltz (University of Saskatchewan);

The role of thermal decomposition in the degradation of organic compounds in the flame ionization detector; by Arthur T. Blades;

Fatty acid composition and primer specifity of de novo fatty acid synthetase in *Bacillus globispores, Bacillus insolitus,* and *Bacillus psychrophilus;* by Toshi Kaneda, Eleanor J. Smith and Devarray N. Naik;

Circular polarization for precipitation measurement; by E. Torlaschi (now Universite du Quebec), Robert G. Humphries and Brian L. Barge;

Optimization of coal liquefaction reactors; by M.P. du Plessis, B. Ozum and M.N. Oguztoreli (University of Alberta);

Optimal control of a continuous two valves in series let down flow system; by M.N. Oguztoreli and B. Ozum;

Quantitative methods in ichnology: spacial distribution among populations; by S. George Pemberton and Robert W. Frey (University of Georgia);

Hydrogenation and hydroformylation reactions using binuclear diphosphine-bridged complexes of rhodium; by Alan R. Sanger;

A mechanism for initiation of bitumen displacement from oil sand; by Koichi Takamura and Ross S. Chow;

Correlation of carbon-13 and nitrogen-15 nuclear magnetic resonance chemical shifts with polargraphic reduction potentials of parasubstituted benzenediazonium salts and their electronic structures; by R.M. Elofson *et al.*;

Recovery of water and alkali used in oil sands and heavy oil extraction; by Michael A. Kessick.

ALBERTA
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Volume 5, number 7 Newsline July 1984

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Dr. Kaneda named Research Fellow

Dr. Toshi Kaneda, distinguished microbiologist with the Alberta Research Council, has been appointed Research Fellow by the Board of Directors.

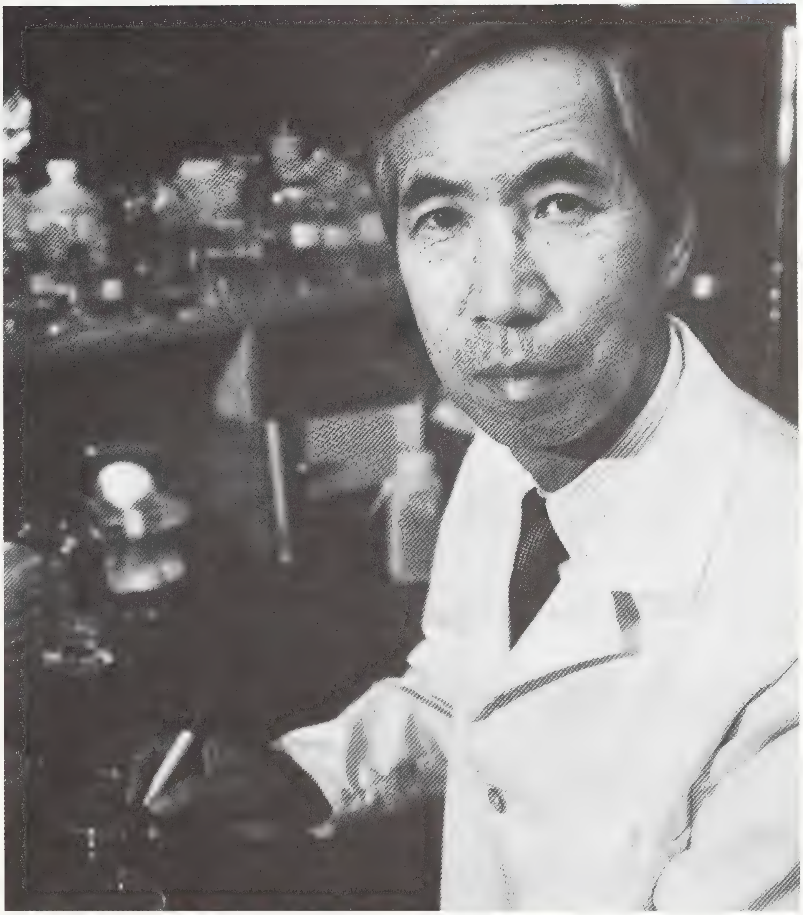
In making the announcement, Dr. Robert W. Stewart, President, said: "to be named a Research Fellow must be considered a great honor ... the process for selection includes reviews by eminent external referees who are asked to confirm that the research of the individual is of high scientific quality and of an international standard."

Dr. Kaneda received his early education in his native Japan, obtaining a Bachelor of Engineering from the Tokyo Institute of Technology, where he also completed his graduate work. He later graduated from Tokyo University with a Doctor of Science degree. He did his postdoctoral studies at the Prairie Regional Laboratory of the National Research Council in Saskatoon, and the Biochemistry Department of Western Reserve University, Cleveland, Ohio.

In 1960 Dr. Kaneda joined the Research Council with a general mandate to do microbiological work relative to petroleum and he chose to study branched-chain fatty acids which are probably biological sources for one class of hydrocarbons in petroleum. He specialized in this area of biochemistry establishing a worldwide reputation for himself and the Research Council.

He has done work on hydrocarbon degradation to assist in cleaning oil spills and on bacterial modifications of bitumen that might improve in-situ recovery processes.

In the past few years, Dr. Kaneda has shifted his emphasis to agriculturally oriented work and developed the low temperature biology project as part of the Research Council's biotechnology program.



Dr. Toshi Kaneda, Research Fellow

He has produced some 41 scientific publications which have been cited more than 300 times by other authors. He is an Honorary Professor, Department of Medical Microbiology at the University of Alberta.

His pioneer research on fatty acids was recognized by the Medical Research Council of Canada as being of high scientific quality and of significance to medical research, and he was one of a small number of non-university scientists to receive an annual grant from MRC.

As a Research Fellow, Dr. Kaneda plans to concentrate his research activities in the field of lipid biology and enzymology.

Newsline is a monthly publication for the employees of the Alberta Research Council.

Please send all submissions
and direct all questions to
Elizabeth Page, Alberta Research
Council, 7th Floor, Terrace Plaza,
4445 Calgary Trail South,
Edmonton, Alberta T6H 5R7

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Larger presence for Calgary

The new Advanced Technologies Department and segments of the Industrial Engineering Division will be located in Calgary in the Research Council's effort to broaden its presence in that city.

The relocation initiative, approved by the Board of Directors at a meeting in Lethbridge June 1, initially included the transfer of some or all of the Geological Survey Department. A subsequent review of the Research Council's financial resources and its commitment to new research initiatives has prompted reconsideration of this proposal.

Fifteen people will be relocated starting in September. Recruitment in Calgary for the Advanced Technologies Program, will soon bring the total staff in the Calgary office to about 40.

An expanded presence in Calgary "should change the way in which our services become available in southern Alberta," Dr. Robert W. Stewart, President, said. In taking this initiative, he stressed the Research Council's objective to work with industry throughout the province and encouraged the private sector to seek assistance from the Research Council for its industrial problems.

Research Council to enter exhibit

Our research programs and services will be highlighted in the Research Council's entry in the Klondike Days feature exhibits at the Agricom Hall 'B', July 19 to 28.

General theme for the Klondike Days Exposition is "The Future." The Research Council's participation with a three-dimensional display is an opportunity to show the general public who we are and the work we do.

Among other entrants are the Alberta Microelectronics Centre and a number of high technology companies, the National Museum of Science and Technology, the Alberta Heritage Foundation for Medical Research, the University of Alberta, provincial government departments, as well as private organizations and companies.

Dr. David Mitchell, Vice-President of the Industrial and Engineering Research Division is facing the camera in this photo of some of the Research Council's guests at a luncheon for Lethbridge business people held in conjunction with the Board of Directors meeting in that city June 1.

Dr. Sanger designs new series of catalysts

Dr. Alan Sanger, experimenting with rhodium and iridium complexes, has discovered a new chemical activity and designed an entirely new series of catalysts.

Catalysts are vital in petrochemicals synthesis manufacture of a wide variety of products - everything from face cream and plastic garbage bags to refined and upgraded fuels. The Research Council, says Dr. Sanger, would like to develop completely new and more diverse technology for such high value-added products as specialist plastics, fibres, cosmetics and pharmaceuticals. But the major objective is new and more economic methods to make bulk liquid products - hydrocarbons or alcohols - for use as fuels.

"Alberta's petrochemical industry is currently using mostly established technology," says Dr. Sanger. "We need to be innovative because the sources of sweet crude are drying up. We must turn more to inferior grade materials in coal, oil and oil sands for liquid fuels, and to novel and more economical processes for petrochemicals."

Developing ways to enhance these lesser grade hydrocarbons is a major thrust of the Research Council and Dr. Sanger's work in the past decade is one aspect of Research Council efforts to take that thrust into the foreseeable future. He has published 20 scientific papers on his work at the Research Council. His experiments indicate that when catalysts containing two or more metal centres, rhodium or iridium, are linked with a diphosphine, for example, their activity acting in concert is greater and more selective than two metal centres operating separately.

The discovery of this new chemical activity is scientifically fascinating in itself, he says, but is not of immediate direct economic importance. Thus the more esoteric aspects of the current study are winding up, and applications are being investigated.

What is important, Dr. Sanger points out, is that the understanding of interactions between metal centres provides a stepping stone to the understanding of economically developing and important industrial materials. The next step is to take this core idea and apply it in an attempt to provide more efficient processes to make valuable liquid products, ethanol, methanol or hydrocarbon fuels.

"If we have the resource plus the process technology, we may be able to encourage development of secondary and tertiary petrochemicals industry in Alberta," says Dr. Sanger.

Human Resources - a people place

The Human Resources department is the Research Council's people place.

Once a small informal organization, Human Resources now has a staff of 10 to look after the personnel records and pay and benefits of 535 employees, develop and interpret personnel policies, recruit staff, carry out negotiations, implement in-house staff development courses and operate the Occupational Health Unit.

"Our primary role is to serve department managers and we devote a great deal of our time to serving the needs of our employees as well," says Director Don Peckham.

Recruitment has been the department's staple diet but Don says today's economy means less activity in this area and a shift in emphasis to meeting new corporate goals through manpower planning and career development.

Research Council employees receive identification cards bearing their photos ... usually taken by Florence Vallee seen here focusing on one of her subjects.

"Although some positions have been eliminated, we are trying to retain staff by filling vacancies internally. We are also taking advantage of grants and money available from other sources such as the National Research Council's undergraduate and post-graduate industrial research scholarships which benefit both individuals and the Research Council."

Since its inception the Human Resources Department has made substantial improvements to many of its standard programs such as job evaluation and pay and benefit administration. And the department has expanded its role in providing training courses for staff.

This fall, the department plans to launch a project management course in cooperation with the University of Alberta, intended as an introduction to planning and managing a research project.

Another growth area is occupational health which has developed from the policy stage to a fully functional health unit with a staff of two, focusing on health concerns related to the occupational environment.

The Research Council's Human Resources Department hosted the first two-day conference on human resources issues attended by representatives of other provincial research organizations. Wolf Gut from the Research Council, right, welcomes Robert MacNeill, administration manager of the Nova Scotia Research Foundation and Jill Ford, personnel coordinator of B.C. Research.

Human Resources Department receptionist Shirley Morton is often the first person to welcome new employees to the Research Council. Shirley greets Brendalee Bowman who recently joined Editing and Publications Sales.

"In response to need," says Don, "we have expanded our services and brought together personnel with the kind of expertise and experience one finds in most comparable organizations."

How they did it! Debbie Bernard, Purchasing Department, and Bernard Trevor, Civil Engineering Department, climbed to the top in the Staircase Challenge at Terrace Plaza during National Physical Week. Seventy-three staff members tramped up a total of 10,552 flights of stairs, and the best floor totals were recorded by the sixth floor - 3,374 and the fourth floor - 3,016. The winners proudly wear their prize T-shirts and congratulations go to all the energetic participants.

Groups tour

Three diverse groups toured Research Council facilities recently.

The Atmospheric Sciences Department presented an information and training session for 25 Alberta Agriculture district agriculturalists and regional directors from central and southern Alberta in preparation for the department's summer field season.

Members of the Edmonton Chamber of Commerce coal committee toured the Coal Department's interim high pressure facility at Nisku and a science and technology study group from Heilonjiang, China, toured several Research Council areas at Terrace Plaza, the Campus Building and Parsons Facility.

Pack your hiking boots and camera!

Leslie Lorinczi's photography group is planning an overnight excursion to the foothills August 24 and 25, with an all-day easy hike in the vicinity of the North Saskatchewan Glacier. A barbecue Friday evening and mountain picnic lunch Saturday are planned.

The field trip is open to all Research Council staff and their families. Details regarding transportation, accommodation Friday night, costs and schedule will be announced in the next issue of Newsline.

Those interested in joining the group are asked to call Mika Madunicky in the Geological Survey Department, 438-0555.

The photography group was formed last winter when approximately 15 staff members got together for weekly lectures and demonstrations by Leslie Lorinczi of Graphic Services.

Science Fair prize winners

Today's school students are tomorrow's scientists, and one form of encouragement is the science fair. The Research Council endorses such endeavours through a series of prizes as well as participation by individual staff as judges.

This year, the Research Council donated prizes to the Edmonton Regional Science Fair, the Central Alberta Regional Science Fair, Red Deer and the Lethbridge Regional Science Fair.

Shawn Acorn, Grade 11 student at Harry Ainlay High School, won the Research Council's earth science award for his entry in the Edmonton Regional Science Fair. It marked the third consecutive year that Shawn has won the Research Council prize. His entry was entitled "Essential Geophysical Prospecting of Mineral Resources."

Allison Kobsar and Florence Yanuario, grade five students at St. Patrick School, received honorable mention in the same category for their project, "Mountains."

Dr. Don Gerson represented the Research Council at the awards ceremony in April. Judges for the earth science award were Julian Fox, Geological Survey, Dr. Guy Goyer, Atmospheric Sciences, Marcel Polikar, Oil Sands, and Claude Sauveplane, Groundwater.

At the Central Alberta Regional Science Fair in Red Deer, the Alberta Research Council awards went to Jenifer Gerlach of Cremona, winner of the life science entry, Brent Stutheit and Kelly Smigorosky of Rimbey for physical science, all elementary school students.

For a project on "Fibre Optics", Scott Gilchrist and Dan Hunter, grade eight students at Cardston High School, Cardston, were awarded the Alberta Research Council prize presented at the Lethbridge Regional Science Fair.

Employee Changes

We welcome to the research Council:

Susan Iwaskow, Clerk Typist, Facilities Management; **Fritz Kamprath**, Building Manager, Devon, Facilities Management; **Brenda Leeson**, Switchboard Operator, Facilities Management; **Linda McLean**, Clerk Typist, Oil Sands Research.

We wish the following well in new endeavours:

Margaret Kozikowski, Graphic Services; **Kiry Non Chhom**, Oil Sands Research; **Ian Tasker**, Oil Sands Research.

Graphic Services transfer

Graphic Services, formerly part of the Natural Resources Division, has been transferred to the Finance and Administration Division, effective June 1.

ALBERTA
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AL 1562

Volume 5, number 8

Newsline

August 1984

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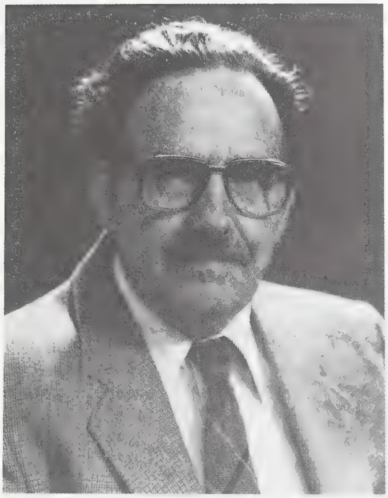
David Mitchell to head Calgary office



Dr. David L. Mitchell

Dr. David L. Mitchell, Vice-President of the Industrial and Engineering Research Division, has been appointed regional vice-president to head the enlarged Calgary offices of the Alberta Research Council.

In making the announcement, Dr. Robert W. Stewart, President, said "with emphasis being placed on assisting industry, Dr. Mitchell is ideally suited to this position."

The Research Council's Calgary office will consist of a major portion of the Industrial Development Department and the new Advanced Technologies Department. In addition to heading these departments, Dr. Mitchell will be responsible for the development of Research Council initiatives and management of approved joint research ventures. Development of current and new ways of delivering the service to industry program to the private sector is also part of his mandate.

Dr. Mitchell joined the Alberta Research Council in 1964 as an industrial chemist in the Product Research and Development Division, becoming project supervisor in 1968. In 1974 he was appointed chairman of a task force to prepare proposals for the Research Council's research and development on oil sands. He was responsible for organizing and developing the Oil Sands Research centre and in 1978 was appointed manager of the Oil Sands Research centre, a position he held until being appointed vice-president of the Industrial and Engineering Research Division in 1980.

He holds a Ph.D. in organic chemistry from Queen's University, where he also received his Master's and Bachelor's degrees. He was a part-time lecturer in organic chemistry and Research Fellow at Royal Military College, Kingston from 1959-61.

In 1961 he accepted a position as lecturer in organic chemistry at Makerere University College, Kampala, Uganda, then served as a technical/industrial consultant to the Uganda Development Corporation before returning to Canada in 1964, when he joined the Research Council.

Dr. Mitchell will move his office to Calgary later this summer. He will maintain an executive office in Edmonton and will continue managing the Industrial and Engineering Research Division.

Natural Resources Division reorganized

The Natural Resources Division is streamlining its departmental structure to meet an increasingly multidisciplinary emphasis oriented toward solving problems posed by society.

The Board of Directors approved the reorganization which calls for three departments - Atmospheric Sciences, Terrain Sciences and Geological Survey - to replace the existing four departments. Graphic Services already has been transferred to the Finance and Administration Division.

The major organizational change is the formation of the Terrain Sciences Department which will focus on land related research problems such as land reclamation, erosion, soil salinity, and terrain mapping. Surficial (quaternary) geology research is being transferred to Terrain Sciences. Much of the research within this department will be oriented toward agriculture, forestry and transportation.

Studies of formation fluids related to the exploration and production of hydrocarbons will fall under the new Basin Analysis Group in the Geological Survey Department.

The Atmospheric Sciences Department will maintain a continuing emphasis on diversifying program activities beyond hail studies to include other aspects of atmospheric processes, particularly snow enhancement and pollution studies.

Reducing the number of research departments will reduce administrative overhead and result in greater efficiency in performing research, says Division Vice-President Dr. Ken Babcock.

"Project groups, which will form the basic operating units within the new organization, will provide a flexibility of operation not previously present,"

CONTINUED ON PAGE 2

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CONTINUED FROM PAGE 1

says Dr. Babcock. "Project management should be improved and the number of isolated one-man projects will be reduced."

Within each of the three departments there also will be one future oriented group which will attempt to emphasize innovative research.

Dr. Bob Fessenden is Head of the Terrain Sciences Department, Dr. Grant Mossop is Head of the Geological Survey Department, and Dr. Bob Humphries continues as Acting Head of the Atmospheric Sciences Department. Gordon Gabert, who headed the former Groundwater Department, has returned to research work.

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Coal Research
Frontier Sciences Research
Industrial & Engineering Research
Natural Resources Research
Oil Sands Research
ALBERTA RESEARCH COUNCIL

The Research Council's attractive exhibit in the Klondike Days Futures showcase at the Agricom last month drew hundreds of interested spectators during the 10-day event. Plans are being formulated to make the display available for other exhibits and trade shows.

Geology paper one of best

Dr. Peter McCabe, Geological Survey Department, is one of seven scientists whose papers were selected as the best out of 350 papers presented at the American Association of Petroleum Geologists annual meeting in San Antonio, Texas, earlier this year.

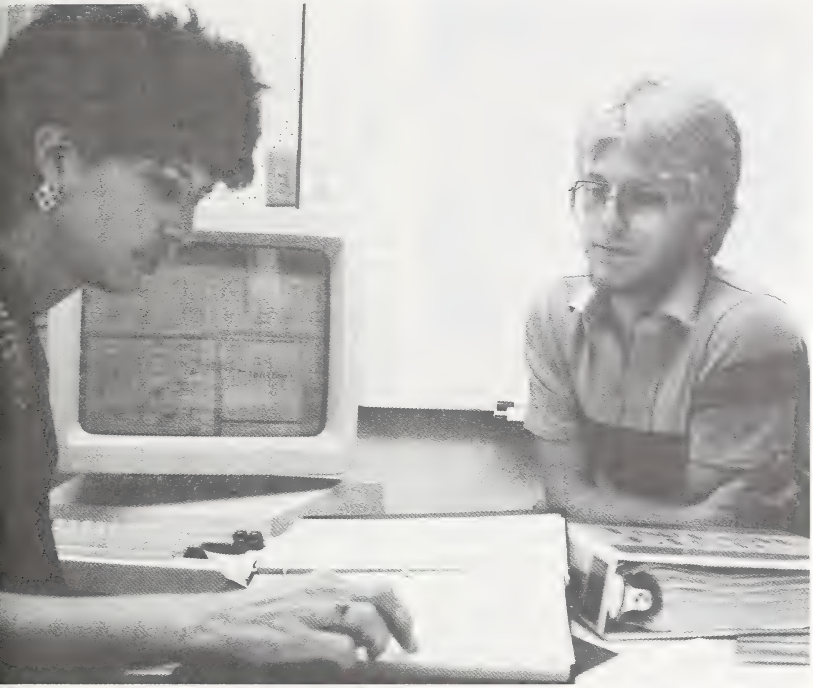
He has been invited to present his paper at the Society of Exploration Geophysicists annual convention in Atlanta, Georgia in December. Both annual meetings attract some 9,000 delegates each.

Dr. MacCabe holds a Ph.D. from the University of Keele, England. He worked with Exxon Production Research in Houston prior to joining the Research Council a year ago.

The topic of his paper is "Influence of Strike-Slip Movement on Terrestrial Sedimentation in Upper Carboniferous Sediments of Nova Scotia and New Brunswick."

Clovis Lima, right, a geologist with the Ministry of Mines and Energy, Brazil, visited the Research Council for a first hand look at the peatlands inventory pilot project completed last year under the direction of Dr. Larry Turchenek, Terrain Sciences Department. Mr. Lima is in Canada for a three-month training program in peatland inventory methodology arranged through the Canadian International Development Agency.

Summer jobs help students and Research Council



Summer student Brian Lake with Dr. Renee Elio, Computing Department, working on LISP expert system.

Summertime and the living is ... great say students working at the Research Council.

More than 60 students are scattered throughout the divisions. About two-thirds are directly supported by the Research Council, while the rest have been hired through such funding as NSERC (National Sciences and Engineering Research Council of Canada) grants. Another 35 young people have been placed in factories under the Industrial Research Assistance Program (IRAP) funded by the National Research Council, as an extension of the IRAP in-plant technical services.

Some, like Gail Miklos and John Kirk, are newcomers to the Research Council, while others like Brian Lake have returned each summer over several years, filling new roles as their experience and skills develop.

Gail is one of the 20 students working in the Atmospheric Sciences Department (ASD). A first-year computing science student at the University of Alberta, Gail is spending the summer working on the research aircraft's software programs.

Another computing science student with less than a year to go to graduation, Brian Lake is at the Campus Building assisting Renee Elio in her work on an expert system. Last year Brian worked with Mark Johnson in Atmospheric Sciences Department computing and for two summers before that he was a radar technician at ASD's field operations base in Penhold.

"I've learned a lot every year and Research Council staff are great people to work with," says Brian.

Dane Bosman also considers himself "very lucky to get such a wide range of experience". A graduate of NAIT, with a two-year course in earth resources, Dane began his working stint at the Oil Sands Research Department under a federal PEP (Placing Employment Personnel) grant last November. He transferred this spring to the Geological Survey Department, spending two months with the aggregate survey before going to Dinosaur Provincial Park for field work under Emlyn Koster.

His NAIT course plus work at the Research Council has pointed the way for Dane who is now contemplating university studies in geology.

Geology student John Kirk has his B.Sc. and is working on his Master's degree in geology. He is studying how different types of fluids react with core samples from in situ oil sands.

John got his summer job through a joint arrangement between the Research Council and the University of Alberta - "the Research Council had an opening which was ideal for a graduate student and I was recommended for it."

Anne Lacouciere, Three Rivers, Quebec, and Jacques Senechal, Chicoutimi, Quebec, are among two exchange students working in the Biotechnology Department under a Quebec/Alberta Special Manpower Program. They are learning about fermentation technology and "doing an excellent job" according to department head Dr. Don Gerson. "Anne and Jacques have done enough work to result in a scientific publication."

The Geological Survey Department and the Atmospheric Sciences Department hire the bulk of the summer students.

"Summer students are an essential part of our operation," says Dr. Ken Babcock, Vice-President of the Natural Resources Division. "They do a lot of field work and reduction of data."

Although the Research Council with its budget restraints has not been able to hire students to the same levels as in previous years, Dr. Babcock says "we couldn't function without them."

Calgary site of energy conference

The Canadian Energy Research Institute and the Calgary Chamber of Commerce are sponsoring a two-day Petroleum and Natural Gas Markets Conference September 24 - 25 at the Calgary Convention Centre.

Leading international authorities will discuss the major issues and anticipated developments in the world oil market and North American natural gas markets.

The Canadian Energy Research Institute is a non-profit research organization sponsored by various Canadian government agencies and some 60 energy companies.

Dr. Emlyn Koster chats with Dr. David Suzuki, host of the Nature of Things, during filming in Dinosaur Provincial Park.

Taking a look at dinosaurs

Dinosaurs will be the subject of an hour-long special to be aired on the CBC's Nature of Things in the fall season.

Some of the filming was done in Dinosaur Provincial Park, a UNESCO World Heritage Site, unique in its abundance and diversity of dinosaur remains. Dr. Emlyn Koster, Geological Survey Department, has been doing sedimentological research in Dinosaur Park since 1981, and acted as a consultant to the CBC in the geological background to the ancient dinosaur habitats in Alberta.

The telecast has been two years in the making and footage was also shot in central Africa, Florida and the Peace River Canyon, B.C.

Scholarship recipients renominated

Recipients of the 1983 Alberta Research Council scholarships have been renominated for the 1984/85 awards.

Rene Joseph Labbe, of Edmonton, will receive the Karl A. Clark Memorial Scholarship to continue his Master's degree program in soil science at the University of Alberta. Mr. Labbe is concentrating on research on the problem of potassium deficiency in crop production.

Martin O. Jeffries, of Calgary, will receive the Alberta Research Council Scholarship to continue his work in the field of Glaciology at the University of Calgary. His topic spans several fields such as geological and water resources, energy resources and transportation related to the evolution of the Arctic Ice Shelf in North Ellesmere Island.

Employee Changes

We wish to welcome to the Research Council: **Marilyn Grabowski,** Clerk Typist, Financial Services.

We wish the following well in new endeavours:

Helen Allen, Records Management; **Brent Ford,** Financial Services; **John Malinski,** Coal Research; **George Pemberton,** Geological Survey; **Allan Pollock,** Human Resources; **April Scott,** Secretariat.

Weather Modification Council to visit ASD

Members of the North American Interstate Weather Modification Council will get a look at the Atmospheric Sciences Department's field operations when it meets in Red Deer August 14-16.

Red Deer was chosen as the site of this year's convention to give members the opportunity to see the work in weather modification being carried out by the Research Council.

Excursion details

Give yourself a break and sign up for the overnight mountain excursion planned by Leslie Lorinczi, Graphic Services and Mika Madunicky, Geological Survey Department. Here are the details:

A van (seating capacity - 12 people) will leave from Terrace Plaza August 24 at 1 p.m.,and drive to Lake Abraham for a barbecue. Overnight accommodation will be at David Thompson Resort, 30 kilometres from Nordegg, two persons to a room.

The van will leave early Saturday morning for a full day of hiking and photography in the mountains, with a picnic lunch at noon.

The cost: $60 per person to cover accommodation, gas and insurance. Everyone is expected to bring their own lunch on Saturday. Return to Edmonton will be late Saturday night.

New look for baseball team

Our mixed slow pitch baseball team has a new look - caps and shirts bearing the red-on-white Research Council logotype. The team is again playing in the Nisku Industrial League.

Players include: **Doug Boisvert** -Geology; **Brenda Morgan** - Human Resources; **Dan Magee, Dale Hite, Rick Buck** - Graphic Services; **Brad Anderson** - Oil Sands Information Center; **Cindy Stachniak, Diane Wasylyk** - Purchasing; **Henry Range, Greg Sterenberg** - Terrain Sciences; relief players **Wes Baird, Joan Rodvang** -Geology; **Mark Trudell** - Terrain Sciences; coaches - **Steve Moran** - Terrain Sciences and **Doug Boisvert**.

If you are interested in being a spare or taking a turn behind the plate as umpire, contact team manager Diane Wasylyk - 438-1666.

ALBERTA
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Volume 5, number 9 September 1984

Newsline

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Advanced Technologies sets up in Calgary

The new Advanced Technologies Department is setting up an office in Calgary and the immediate challenge facing Department Head Brian Barge is finding the right people to staff it.

Modern microelectronics, computer and automation technologies are vital to industrial development, not only for product innovation in new high technology industries, but also renewal in existing industries, says Dr. Barge. Over the next year, he will be looking for scientists with physics and computing backgrounds and electrical and mechanical engineers to fill the 10 new professional staff positions.

A firm believer in the team approach, he identifies as a critical element in building the program "merging know-how in a team-like atmosphere."

The effectiveness of the Advanced Technologies programs depends on close interaction with the Research Council's information services, service to industry and computing activities, he says.

Dr. Barge was instrumental in the development of the Advanced Technologies Program, and sees the Research Council playing a key role in industrial development and technology transfer - by acting as a conduit between industry and the universities.

"We must work very closely with industry and the universities," he emphasized.

Supporting existing Alberta industrial sectors such as energy, manufacturing and agriculture is already part of the Research Council's work -- "but there is room for improvement if we want to remain internationally competitive. We also need to stretch beyond today and look at adaptation of technologies such as database management, expert systems, computer-aided design and computer-aided manufacturing.

"The Advanced Technologies Department intends to provide enhanced private sector exposure to the advanced technology devices, aids and tools," he says and adds "we intend to work with interested Alberta firms to help improve their competitive position in the national and international marketplace, where these advanced technologies are more prevalent."

One of the stepping stones to the Advanced Technologies Department has been the Research Council's experience in joint research ventures which will now become a component of Advanced Technologies. Thus incorporated, such joint ventures provide a mechanism for research and development meeting direct needs of Alberta industries, for contracting out R and D activities in which the Research Council has a particular interest, and a direct means for stimulating product development in industry.

Appointment announced

Dr. Brian Barge

Dr. Brian Barge has been appointed Head and Program Manager of the Advanced Technologies Department now being established in Calgary.

A graduate of the University of Saskatchewan in Honors Physics, he holds M.Sc. and Ph.D. degrees in meteorology from McGill University. He joined the Research Council's Atmospheric Sciences Department in 1972. In 1982 Dr. Barge was named Head of the Atmospheric Sciences Department and played a major role in transfer of weather radar technology from the Research Council to an Alberta industrial firm for international marketing. The world class cloud physics research aircraft, used in the Research Council's weather modification projects and marketed internationally, became a reality in 1982 due in large part to Dr. Barge's leadership.

Last year he was named Acting Manager of Advanced Technologies, responsible for development of the program.

He is a member of the Research Council's research committee, dealing with technical aspects of research within the organization.

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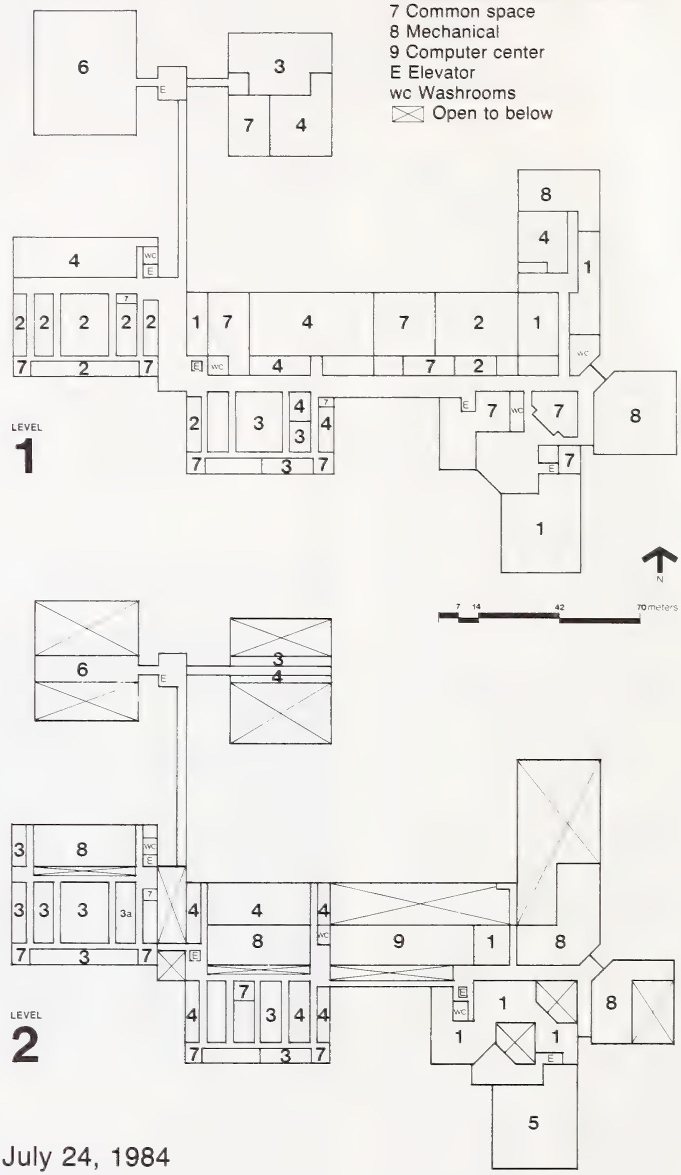
Mill Woods facility: same time next year

Mill Woods - Initial occupation of leased space



1 Finance & Administration
2 Natural Resources
3 Frontier Sciences 3a Joint Venture (BIO LOGICALS)
4 Inudstrial & Engineering Research
5 Executive
6 Electronic Products Test Center
7 Common space
8 Mechanical
9 Computer center
E Elevator
wc Washrooms
☒ Open to below

July 24, 1984

Countdown - this time next year, most of us will be making the Big Move!

Forest Products research staff are already poised to move into one of the high head laboratories at Mill Woods, with the Biotechnology Department to be phased in this fall in adjoining space in the same laboratory.

The Operations Committee has reviewed and approved the global space allocations for the initial occupancy of the main laboratory and office building which is expected to be ready to receive the first tenants early next summer.

Space allocations have been made on projected departmental and activity needs, said Dr. Robert Green, Vice-President of Operations, but no individual office and laboratory assignments will be made until sometime in 1985.

He also emphasized that space will be assigned on a project need basis only for the length of time of the need and will not be "owned" by an individual department in perpetuity.

However, for some activities which require project-specific custom designing, such as the Gasoline and Oil Testing Laboratory, a particular space allocation has been made. Laboratory and testing areas which call for like equipment have been consolidated to avoid duplication of equipment and eliminate waste space, Dr. Green said.

Environmental chambers, freezers, coolers, ovens, furnaces, grinding and crushing equipment will be located in a centralized area to be shared by divisions and departments as needed. One large central location has been designated as a computer centre and an electron microscopy suite will house the Research Council's electron microscopes and like equipment.

Earmarked to move to the new facilities are:

- All staff and activities in the Campus Building;
- Activities in the Groundwater warehouse;
- Staff and activities in the gravel laboratory;
- All staff and activities located in Parson's Property Warehouse;
- All staff and activities in the Industrial and Engineering Research Division with the exception of those scheduled to move to Calgary;
- All staff and activities in the Finance and Administration Division and Executive Offices, with the exception of Graphic Services;
- Staff and activities in the Atmospheric Sciences Department located in Terrace Plaza.

Staff to remain in Terrace Plaza will be the Geological Survey Department, Terrain Sciences Department, staff with Agriculture Canada, and Graphic Services.

Bob MacMillan tells of Tanzanian sojourn

The scene - a field of wheat beneath the tall sky - typically western Canadian, yet it is set in the interior of Tanzania, half a world away.

The similiarity is not an illusion. Soil scientist Bob MacMillan says he "felt at home" when he first arrived at the site of the Tanzania -Canada Wheat Project Two years ago. He describes the area as a microcosm of southern Alberta, exhibiting the same moisture deficiency and similar soil attributes of fine texture, high fertility, and dark surface colors.

Six farms encompassing 70,000 acres lie above the great rift escarpment in the shadow of Mount Hanang, an extinct volcano. The Tanzania - Canada Wheat Project was started in 1972, jointly funded by both countries, with the achievement of wheat self-sufficiency for Tanzania as the ultimate goal. Through the Canadian International Development Agency (CIDA) Canada has provided technological aid and Canadian advisors, among them Bob MacMillan.

An outline of his work as a soil surveyor is documented in a paper presented last December at a meeting of the Eastern Africa Soil Correlation Committee. He returned to the Research Council this spring and *Newsline* asked about day-to-day living, about the people and the country beyong the farm complex.

"One spends an inordinate amount of time getting everything from petrol to sugar and flour. Supplies and services are just not available. The whole pace of life is slower. You go in with a North American motivation to get things done quickly, only to have a different mode imposed upon you," says Bob. "The slower pace is often frustrating.

"One is forced to learn social skills not practised in this country. In any dealings with the local people, one must take the time and make the effort to show a genuine interest in their well-being before discussing the business at hand. It is part of the rhythm of a way of life which impressed itself on me. Returning to Canada was almost an assault to the senses."

Every couple of weeks, Bob made the drive from his home base in Arusha to the Hanang Wheat Project 300 kilometres away. Depending on the season the trek meant clouds of dust or maneuvering through axle-deep mud. Much of the route is rough, isolated bush country, seemingly uninhabited, but stop to fix a tire, say Bob, and up to 50 Barbaig tribesmen will materialize out of nowhere. Knowing Swahili, something many of the soil surveyors learn, made these situations easier.

Bob describes the semi-nomadic Barbaig as primitive, but intelligent, deriving a living chiefly from livestock herding. They may see jets flying overhead but their own way of life is relatively untouched and the local hero is a tribesman who killed a lion with his spear.

"They have the same basic desires as we - shelter, food, clothing - but at an entirely different level: sugar, for example, is a luxury."

The bulk of the population goes through government schools to grade 6 and the exceptionally motivated like his surveying counterpart, Sigu, go on to technical school. Sigu obtained his technical agricultural diploma from the School of Agriculture in Saskatoon.

At the Hanang Wheat Project, Tanzanians manage the farms, do the work, and make the decisions on when and where to seed.

"The strong need to produce goods and services is as typical of Tanzania's population as it is of Canadians," says Bob but the similarity stops there.

"The difference is that in Canada we have more than enough of everything. In Tanzania, there just isn't enough of anything."

Soil scientist Bob MacMillan is hidden behind the report he's writing in African bush country while a group of Barbaig tribesmen silently watch. Sigu, Bob's assistant, in western dress, leans against vehicle.

Finding out about 5th generation

Expert systems, their applications and impact on society will be discussed at a 5th Generation Computing and Expert Systems Conference September 20 to 21 at the Westin Hotel, Calgary.

The two-day sessions, with talks by international experts in the computing field, are being sponsored jointly by the Calgary Research and Development Authority and the University of Calgary.

Dr. Alan Vanterpool, Director of the Office of Science and Technology of Alberta, will be chairman of a panel discussion, "The Future of Fifth Generation Computing in Alberta."

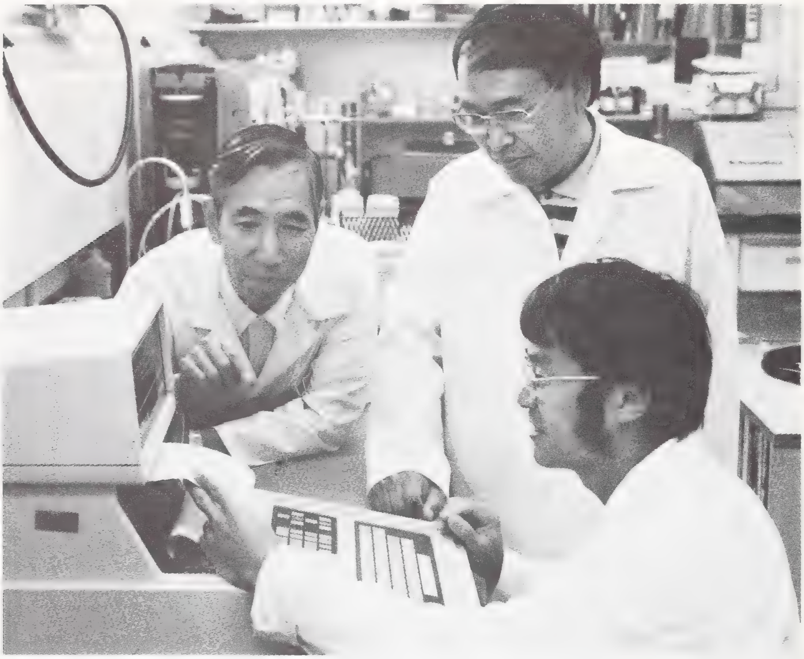
Visiting scientists working in biotechnology lab

Dr. Hitoshi Obata, Associate Professor at Kansai University, Osaka, and visiting scientist Masami Uebayashi from the Fermentation Research Institute, Tsukuba, Japan, are currently working in the Biotechnology Department at the Campus Building.

Dr. Obata spent half a year with Dr. Toshi Kaneda in 1975 working on a stereospecific dehydrogenation of a compound related to a bitumen model compound.

Dr. Obata has returned to the Research Council on sabbatical leave and is studying the enzymatic hydroxylation of an aromatic acid by a bacterial enzyme.

Mr. Uebayashi is studying an enzyme involved in an initial step of fatty acid synthesis by a bacterium. He has been purifying the enzyme using a chromatographic system which is based on a microprocessor, part of Dr. Kaneda's program in connection with the Research Council's crop improvement projects.



Dr. Toshi Kaneda, Research Fellow, left, and Dr. Hitoshi Obata of Kansai University, Osaka, watch as visiting scientist Masami Uebayashi checks results from measuring radioactive products of an enzyme reaction using a scintillation counter.

Propane prohibited

Propane fuelled vehicles are prohibited from parking in any underground parking facility or within an enclosed public structure designed for parking vehicles.

This legislation applies to the Research Council's underground parking at Terrace Plaza, and to government owned vehicles as well as employee vehicles.

Employee changes

We wish the following well in new endeavours:

Michael Banovich, Materials and Testing; **May Fong,** Atmospheric Sciences; **Paul Jadernik,** Coal Research; **Ray Khan,** Financial Services; **Craig Korth,** Materials and Testing; **Terry Krauss,** Atmospheric Sciences; **Bernard Luft,** Advanced Technology; **Linda McLean,** Oil Sands Information; and **Robert Tennant,** Coal Research.

Spreading the word

The Research Council's profile got a boost this summer with exhibits in three communities, generating interest from the public who dropped by to view the displays.

Approximately 4,000 people visited the new exhibit when it was set up in the Agricom for Klondike Days in July. Another 25,000 people attending the airshow in Red Deer in August had an opportunity to become acquainted with Research Council activities through the same exhibit. And coal research was highlighted in a display at Devon's first annual trade fair held in June when Leslie Black, Cathy Sampson and David Aitchison represented the Research Council.

On the trail

Nine staff members who will work in the Research Council's Calgary office are expected to settle in this month.

Headed by Regional Vice-President David L. Mitchell, they include Dr. Brian Barge, Head of the Advanced Technologies Department, Dave Baker, and Bob Zezulka, Advanced Technologies; John Holub, Head of Industrial Development Department (part time); Mary Hart, Rick Hart, Dean Rosychuk and Michael Werb, Industrial Development Department, joining Chuck Harrison and Heidi Leury already in Calgary.

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Volume 5, number 10 October 1984

Newsline

Field fluid program taps hot theory

Technologist Doris Regula conducts water analysis at Oil Sands Research laboratory.

A remote sensing tool which could benefit industry in the recovery of in situ oil is being developed by an oil sands research team at the Research Council.

Billions of barrels of oil lie locked in Alberta's oil sands, too deeply buried for surface mining and too viscous to be extracted by conventional pumping. In collaboration with the Alberta Oil Sands Technology and Research Authority (AOSTRA), the Research Council's biggest research effort is geared to enhanced recovery based on steam injection - that is, heating the oil to lower the viscosity and pushing it to a surface wellhead.

What is essential in this process is a "communication path" tens of metres long beneath the surface between the point of steam injection and where the oil is pushed out. Water, at high temperature, reacts with the mineral grains in the oil sands and can create new minerals, or dissolve other minerals only to percipitate them along the communication path, blocking the movement of oil. This can become a serious problem at the high temperatures created by the steam process which speeds up the water-mineral reaction rates tremendously.

There is no direct method for monitoring the reaction in the subsurface. To evaluate what is occurring underground, scientists must see what is produced at the wellhead.

Research Council scientists have turned their attention to the steam itself.

"No one has been looking at the composition of the produced water," says Dr. Bill Gunter, geochemist in the Oil Sands Research Department.

Dr. Gunter is directing the research and technologist Doris Regula is developing the analytical techniques and on-site application. They are also collaborating with Dr. Ian Hutcheon of the University of Calgary.

For the past year, a Research Council team has been visiting Cold Lake pilot plants to test water sampling techniques, gather water samples and conduct on-site chemical analysis at the wellhead.

Dr. Gunter says because the escape of gases or precipitation of solids from the water which can occur as the temperature and pressure are reduced during sampling, it is imperative that some elements be analysed immediately. A delay in carrying out the analysis

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can alter the chemistry of the samples. All the equipment necessary to make field analysis is portable, powered by rechargable batteries.

"We believe our field fluid sampling program reflects what is occurring in the subsurface," he says. "We know the mineralogy beforehand from geological studies and we know the chemistry of the water being injected. The difference in the chemistry of the production water from the wellhead samples and the injection water can be used as a sensitive indicator of water-mineral reactions."

Sophisticated technology plays an important role in data interpretation. Scientists are starting to use computer models to predict reaction pathways during a steam cycle. The data collected as part of this study will be used to aid in model development.

"Based on production water monitoring, we are looking for meaningful results to give to companies working in oil sands recovery," says Dr. Gunter.

Beating small business drum

Ninety-seven per cent of registered companies in Alberta are designated as small businesses. Small business creates 70 percent of new employment and 80 percent of innovation. Thirty percent of Alberta's GNP is produced by small business.

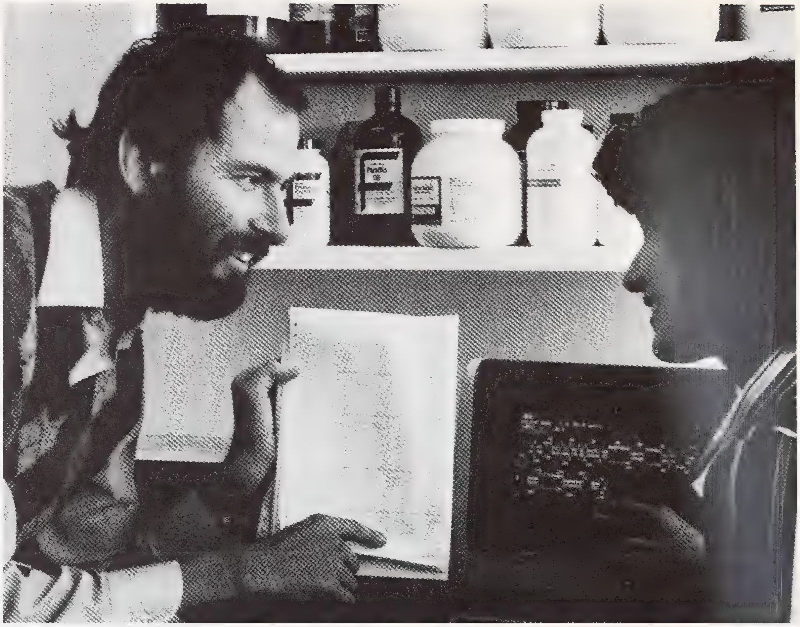
Small business is vital to the economic health of the province and this month Small Business Week is held to focus on the contribution of these entrepreneurs.

The Research Council's Industrial Development Department will be taking part in the Small Business Week information fairs with a display booth at the Convention Inn South, Edmonton, October 22 and 23, and the Glenmore Banquet Centre, Calgary, October 24 and 25. John Holub, Head of IDD, will be presenting information seminars in both cities when he will discuss department services.

Appointment

Dr. David L. Mitchell, has been appointed to the Advisory Council, a forum of consultation to the Calgary Economic Development Authority.

Computer program replaces paper chains



Dr. Kathy Potter, project manager of the joint research venture between the Research Council and BIO LOGICALS inc., and Dr. Terry Stone, computer programmer with the Oil Sands Research Department, interpret results of DNA analysis. Terry wrote the computer program being used by the joint research project team.

The Research Council/BIO LOGICALS joint research venture team was literally climbing the walls before they got a computer and a program for DNA analysis.

Dr. Kathy Potter, project manager, relates how the team had been using scissors to cut out strips of coloured paper representing DNA sequences. In attempting to find gene matches they were stringing paper chains everywhere, over counters and desks until they finally pasted them to the lab walls. The method was time consuming and results had too wide a margin for error, says Kathy.

Even when a computer became available, they faced the problem of having a "user-friendly" program for relatively inexperienced operators.

Enter Dr. Terry Stone, who develops mathematical models for oil sands research. In two days, he designed a DNA analysis program for computer novices.

"It is simple and easy to use, and increases not only the user's capability but also the length of DNA that can be analyzed", says Terry.

He has designed the program to consist of many parts - "one of the nice things about it is being able to add to it on a continuing basis."

Terry has expanded the joint venture computer program with additions of his own, as well as interfacing some very sophisticated DNA analysis programs from other sources.

Last January, Terry and Kathy published a paper on the subject which has drawn inquiries from universities, pharmaceutical companies and the U.S. National Cancer Institute. The program will be available for non-profit and industrial research laboratories for a nominal fee.

Meanwhile Kathy and her team are enthusiastic about Terry's work.

"What once took us an hour to do, we can now accomplish in seconds," says Kathy. "And what's really important is knowing that the computer results are accurate."

Dr. John Dillon to give lecture

Professor John L. Dillon, B.Sc. Agr., Ph.D., internationally renowned agricultural economist and head of the Department of Agricultural Economics and Business Management, University of New England, Australia, will deliver the first Nathaniel H. Grace 75th Anniversary Lectureship in Agriculture at the University of Alberta.

"Technology Versus Hunger: Programs and Prospects" will be Dr. Dillon's topic. The public lecture will take place November 14 at 4 p.m. in the Humanities Centre, Lecture Theatre 1.

The Nathaniel H. Grace Lectureship is one of three annual public lectureships over the next five years presented by the Alberta Research Council as a gift to the University of Alberta in recognition of the university's 75th anniversary.

Dr. Grace (1902-1961) was the first full time director of the Alberta Research Council, appointed in 1951 and serving 10 years until his sudden death in 1961. He was deeply interested in agricultural problems and promoted new initiatives in soil surveys, groundwater studies and hail suppression. Under his leadership the Research Council experienced an era of steady expansion and progress. Dr. Grace also campaigned for new facilities which resulted in the first separate building for the Research Council, completed in 1955.

Dr. Dillon has a distinguished record in the fields of agricultural research, education and production in Australia where he serves on various government committees, and worldwide, particularly in his longstanding participation in the F.A.O. He is currently serving as a consultant to the F.A.O. Panel of Experts on Development Aspects of the Programme for the Control of African Animal Tryanosomiasis and Related Development and is a member of the Advisory Committee on Financial Reporting and Budget Study of the Consultative Group for International Agricultural Research.

He is a Fellow of the Academy of Social Sciences in Australia and a recipient of numerous awards and distinctions including the Distinguished Achievement Citation of Iowa State University for contributions to economics, education and international development.

Prospecting - who has seen the wind?

A hundred years ago, prospecting meant one thing - heading into rugged country to seek one's fortune in gold.

When half a dozen engineers from the Solar and Wind Energy Research Program (SWERP) at the Research Council, TransAlta Utilities Corporation and Nor'Wester Energy Systems Ltd. tramped through Kananaskis and Spray Lakes region this summer, they were "wind prospecting."

They looked at leaning trees and sand dunes in a search for sites exhibiting relatively high wind potential, and of 10 possible sites, five hydro-generation areas were selected and monitored for a three-month period.

Under a contract between the Research Council and TransAlta, wind power monitoring in greater detail is to be carried out for nine additional months at the Kananaskis Dam at Seebe township. Nor'Wester Energy Systems of Calgary has a sub-contract for field installation of a 100-foot meteorological tower and wind shear assessment using simple atmospheric boundary layer flow-visualization techniques.

Objectives of the project are to evaluate the economic and technical feasibility of wind turbine power in utility-oriented applications in Alberta and provide a demonstrable example of wind power utilization in the province.

At the research/demonstration project test site north of Lethbridge initiated by SWERP, Alberta Agriculture and Jensen Engineering Ltd., to evaluate low head wind turbines, two more pumping units have been added, bringing the total number of wind-generated units to nine. In addition, one electrical generating wind turbine is being monitored to evaluate potential wind power production.

The performance monitoring data from the Lethbridge test site is being made available to VITA, a United States volunteer information and technical assistance organization to third world countries, to verify VITA's theoretical wind pumping performance models.

The Brace Institute, McGill University, has requested manufacturer's information and demonstration models for the water supply workshop at the INTERSOL 85 conference to be held in Montreal next summer.

Put it there. Bill Kay of Forest Products Research directs movers in setting up equipment in the east high head laboratory at Mill Woods. Having at last vacated their old quarters at Parsons Warehouse, the Forest Products staff are the first to move into the Research Council's new facilities.

Conference highlights

Conferences offer opportunities for the exchange of ideas and information and Research Council staff are active participants as speakers, chairmen and organizers. At recent or upcoming conferences:

- Dr. Brian Barge, Head of the Advanced Technologies Department, chaired a session at the Canadian Conference on Very Large Scale Integration dealing with high technology, October 1-2 in Edmonton. The Research Council was one of the conference sponsors.
- Dr. Zac George, Chemistry Department, presented a paper and chaired two sessions at the 9th Canadian Symposium on Catalysis held in conjunction with the 34th Canadian Chemical Engineering Conference, Quebec City, Sept. 30 - Oct. 3.
- Dr. Robert W. Stewart, President, will address the fourth annual regional conference of the Institute of Public Administration, Oct. 29-30 at the Westin Hotel. Dr. Stewart is speaking Oct. 30 on The Role of Government in the Economy.
- Dr. Lawrence Cheng, Atmospheric Sciences Department (ASD), is presenting a poster paper, Aircraft Observations of Snowfall from a Synthetic Crude Oil Plant Plume, at the fourth conference on Applications of Air Pollution Meteorology, Oct. 29 - Nov. 4 in Portland, Oregon. Co-authors are Dr. Dave Rogers, ASD, E. Peake, University of Calgary and K.L. Grandia, INTERA Technologies Ltd.

(Are you involved in an upcoming conference? Newsline would be happy to hear about it. Just contact me at 438-1666 ext. 307 - Elizabeth Page).

Dr. Stewart to address ECAT

The Alberta Research Council Role in Technology Transfer will be Dr. R.W. Stewart's topic when he addresses a dinner meeting of the Edmonton Council for Advanced Technology (ECAT) October 17, at the Edmonton Convention Centre.

They gave! The Research Council's Occupational Health Unit organized a one-day blood donor drive in cooperation with the Red Cross which provided transportation to and from the clinic. Among the 18 volunteer donors from Terrace Plaza were Karen Tolonen, Industrial Engineering, Imants Krumins and Bernie Trevor, Civil Engineering.

INQUA symposium an international affair

Twenty-one scientists from nine countries attended an INQUA symposium on the relationship between glacial terrain and glacial sediment facies, organized by Research Council staff and held in the Medicine Hat/Lethbridge region.

The term INQUA stands for the International Union of Quaternary Research which is divided into a number of Commissions. A request from the president of the Commission on the Genesis and Lithology of Quaternary Deposits to hold a meeting in Alberta prompted the session. Dr. Mark Fenton, Terrain Sciences Department, and Dave Proudfoot, a Ph.D. candidate at the University of Alberta, receiving Research Council support, were symposium organizers. Other Research Council staff providing logistic support were Carolyn Jones, Charlotte Mougeot and John Pawlowicz from the Geological Survey Department.

The purpose of the symposium was two-fold: to present a series of papers relating the landscape to the deposits making up that landscape, and to show the delegates the results of a Research Council-supported study Dave Proudfoot is completing on the stratigraphy and facies of the Quaternary sediment exposed in cliffs along the South Saskatchewan and Oldman Rivers in the Medicine Hat/Lethbridge area.

Employee changes

We wish to welcome to the Research Council: **Mitchell Harbora,** Manager, General Accounting, Financial Services; **Kelly LaPlace,** Switchboard Operator, Oil Sands Research; **Twyla Malcolm** and **Janet Marowitch,** Research Technologists, Biotechnology.

We wish the following well in new endeavours: **Susan Barsaloux,** Materials and Testing; **Ruth MacIntyre,** Industrial and Engineering Research; **Brian Pilat,** Oil Sands Research; **Susan Putz,** Geological Survey.

New office hours

Editing and Publications Sales has established new hours for its Calgary office. The office will be open Mondays and Wednesdays from 8:15 a.m. - 12 and 1 p.m. - 4:30 p.m., and on Fridays from 8:15 a.m. 12 p.m.

ALBERTA
RESEARCH
COUNCIL

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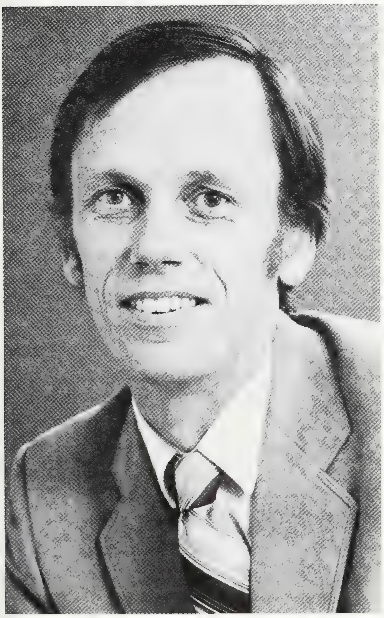
Newsline

Civil Engineering - going down the road

Ribbons of pavement tie Canada together. Our highways form a vital link in the movement of goods from one province to another as thousands of trucks carry logs, piping and heavy construction equipment to their destination.



Dr. J. Tom Christison, Manager of the Transportation Section, Civil Engineering Department, has been awarded the 1983 President's Medal for the most outstanding paper in research presented annually by the Roads and Transportation Association of Canada. Dr. Christison's paper was entitled "In Situ Measurement of Pavement Behaviour Under Load", describing the installation and operation of the instrumentation and mobile data acquisition system developed by the Civil Engineering Department. The medal presentation was made at the 1984 RTAC annual meeting in Montreal in September.

How safe are these vehicles and what impact do they have going down the road?

These are the questions posed in a national study being jointly sponsored by the federal and provincial governments and the Canadian trucking industry.

A wealth of experience in provincial pavement impact research over the past decade has put the Alberta Research Council's Civil Engineering Department in the forefront of the national study. Headed by Dr. Tom Christison, the Research Council's team began this year installing the strain deflection transducers at the 13 test sites from British Columbia to Nova Scotia. That work is expected to be completed this fall, ready for the actual testing program to begin in May.

In 1973, the Civil Engineering Department initiated a similar research program on pavement impact for Alberta Transportation, developing an instrumentation package and mobile data acquisition system. When the national testing study gets under way, the Research Council's research team will travel from coast to coast to hook up the computer to the sensors at the test sites.

The Roads and Transportation Association of Canada is providing the vehicles bearing the same loadings at the different sites so researchers can evaluate the relative destructive effect of loads on different pavement structures on the inter-provincial highway system.

The study will cover: response of differing pavement structures to the same loading level and configuration; the effect of axle spacing on pavement response; the effect of differing truck suspension designs on pavement response; and the response of pavement structures to dynamic loads of varying intensities and duration.

Because each province has its own system, load regulations differ from province to province. The goal of this study is to achieve uniformity in truck weight and dimension regulations across Canada.

Today's laboratories march to a different beat

Government laboratories have had to recognize that their principal responsibility is not so much to push forward the frontiers of science but to advance the economy of their jurisdiction, says Dr. Robert W. Stewart, president of the Alberta Research Council.

Speaking at an ECAT (Edmonton Council for Advanced Technology) dinner October 17, Dr. Stewart said that this change in emphasis is a different concept, requiring different skills and different ambitions - "not a lesser responsibility but a major, sometimes traumatic and very important shift."

The Second World War brought about an unprecedented demand for scientific research and a substantial enlargement of government laboratories all over the world, including the National Research Council and the Alberta Research Council. Tracing the history of the past 40 years, Dr. Stewart said universities did very little research at that time and basic research being done by government organizations produced an ethos in such laboratories that

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Newsline is a monthly publication for the employees of the Alberta Research Council.

Please send all submissions and direct all questions to Elizabeth Page, Alberta Research Council, 7th Floor, Terrace Plaza, 4445 Calgary Trail South, Edmonton, Alberta T6H 5R7

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they perceived their responsibility was to do the research in Canada.

Today with a whole collection of research universities, this is no longer the case and government laboratories have often, against their will, been forced to recognize that the centre for basic research is and should be taken over by the universities, he told his audience.

"A major function of the Research Council is to do adaptive research in areas where the principles are well established, trying to adapt what is known in a number of fields to a particular Alberta situation," he said.

"We must get what we do at the Research Council out in the world efficiently and effectively and make some difference in the economy."

"There are few models for technology transfer - I don't think anybody knows how to transfer technology with confidence and assurance," he said.

"How we handle oil sands research, working closely with AOSTRA, our contracts with individual companies, the access program whereby companies can buy rights to what we have learned, and the patents picked up by AOSTRA, some of which are now being used, are all examples of technology transfer."

He also cited encouraging individuals who make patents "to burst out into the private sector," setting up a company to exploit an invention, and trying a series of joint ventures as some of the attempts being made by the Research Council.

The Research Council has a worldwide reputation in oil sands and coal research and, Dr. Stewart said, Albertans can take considerable pride in an organization with substantial strengths which is doing some very important work for the province.

"There is an enormous amount of luck in whether anything comes off. One can't plan for things -- you can only make it possible for things to occur," he concluded.

Office lines

To call the Calgary office without charge, staff may use the RITE number, 427-2711 and ask the operator for 297-2510 or 297-2511. Calgary staff can reach Edmonton by first dialing 3114.

Dr. James Aber, geologist at the University of Emporia, Kansas, currently on exchange to the Department of Geography, University of Regina, discusses mutual interest in disturbed terrain with Dr. Mark Fenton, Geological Survey Department. Dr. Aber visited the Research Council after presenting a lecture at the University of Alberta.

Board members appointed

Four new appointments have been made to the Research Council's Board of Directors. They are: Dr. Richard K. Kerr, Calgary, manager of technical services, Alberta Energy Company Ltd.; Roy O. Lindseth, Calgary, president of Teknica Ltd. and Teknica Inc.; Dr. Michael A. Ward, Calgary, vice-president of research, University of Calgary; and Robert R. Watt, Edmonton, group vice-president, transmission, Northern Telecom Canada Limited.

They succeed retiring board members: B.W. Brooker, Dr. K.E. Cooper, Dr. R.M. Hardy and M.M. Williams.

Dr. Kerr was supervisor of research and development for the Alberta Energy Company prior to his present appointment in 1983. He initiated and holds patents for a new process to recover sulphur from sour gas being developed in a joint venture with a major Canadian oil company, and for the development of a wet oxidation boiler for enhanced oil recovery, also being commercialized through a joint venture. He previously held several positions, including director of applied research, with Western Research and Development, Calgary.

Mr. Lindseth pioneered Canadian seismic data processing in 1967, developing original frequency domain operations and subsequently the development of the first mini-computer seismic system in Canada. His invention of the Seislog process in 1972 made it possible to estimate lithology and porosity in the subsurface. Concurrently, his development of color coding to indicate geological velocity changes ushered in the widespread use of color graphics in geophysical data reduction.

Dr. Ward, who was appointed vice-president of research at the University of Calgary in July, had been professor and head of the Civil Engineering Department for the past 12 years. Prior to that he served in the Defence Research Establishment, Suffield, Alberta.

Mr. Watt, a native of Crieff, Scotland, served in the Royal Air Force from 1942-1947 before coming to Canada in 1951 when he joined Northern Telecom, then Northern Electric. He has held various engineering and management positions in Canada and two assignments to NETAS (Northern Electric Telekomunikayson A.S.), a subsidiary of Northern Telecom, Istanbul, Turkey.

‘‘Thinking’’ machine is still elusive goal

Geoff Strong and Dr. Renee Elio discussing the expert system they are building to predict hail storms.

In the early days of computer programming, scientists attempted machine translation experiments. When they gave the computer the sentence, ‘‘The spirit is willing, but the flesh is weak’’ for translation into Russian and back to English, the computer came up with ‘‘The wine is strong, but the meat is rotten.’’

Program developers have progressed a long way since then in building today's faster and more complex supercomputers and researchers have been able to build so-called expert systems. But while these supercomputers are able to handle more facts and figures with greater efficiency, they stop short of being able to ‘‘think’’ as a human does and much fundamental research is necessary to build a comprehensive system which can do all that we do.

‘‘The Fifth Generation is coming -it's not here yet,’’ says Dr. Renee Elio, research scientist in the Frontier Sciences Division, referring to the multi-billion dollar race initiated by the Japanese to advance the technology.

‘‘Some AI systems cannot work yet in real time. We think and process information in real time - whatever we do happens immediately. We obviously do things in a mental process we don't understand and simply take for granted.’’

Machines that exhibit some characteristics of intelligent behaviour have been built. Renee cites as examples MYCIN, an expert system developed at Stanford University to aid physicians in the selection of antibodies for patients with severe infections; and Prospector, a mineral exploration consultation system designed to help geologists in regional resource evaluation, ore deposit identification and drilling site selection.

The Research Council recently acquired a special purpose AI development machine using LISP, a programming language for symbol manipulation. Renee has started a project using LISP, with a view to research and design for an AI application related to qualitative atmospheric data not accessible to current analysis systems. She is working with John deHaan of the Computing Department and Geoff Strong from Atmospheric Sciences, to build METEOR, an expert system to predict hail storms. METEOR will combine quantitative predictors and qualitative knowledge with some understanding of spatial and temporal relationships, to reason about weather patterns that change over time.

Renee's interest in AI grew out of her studies in human information processes (she holds a PhD in cognitive psychology from Carnegie - Mellon University, Pittsburgh).

‘‘The computer has given us a new analogy in building models and theories, and there is considerable interchange between AI and cognitive psychology,’’ she says.

As sophisticated as today's computers are, Renee says some of the very things a five-year old can do, like language generation and comprehension, planning, visual information processing, and using ‘‘common sense’’, are incredibly difficult for a computer.

Building an expert system such as Prospector can take a year or more just to elicit the information from a human expert before actual programming begins - what is known as the knowledge acquisition bottleneck. What still faces researchers in the AI field is solving this problem and speeding up the process.

But enough hurdles in building expert systems have been overcome so that industry has embraced the technology and the global race is on to build and utilize super smart machines.

In industry, universities and research and development centres thousands of researchers like Renee Elio, working in the complex realm of computer science, are leading the rest of us into the kind of futuristic environment once considered a fictional figment of the imagination.

Get the picture!

The Atmospheric Sciences Department's work in weather modification has been incorporated in a half-hour film produced by Alberta Agriculture.

‘‘The Weather Picture’’ is scheduled to be shown on CKSA (Lloydminster) Nov. 7 at 7 p.m.; CKRD (Red Deer) and CHAT (Medicine Hat) Nov. 8 at 7:30 p.m.; CFAC (Lethbridge) at 10:30 p.m.; CBXT (Edmonton) Nov. 9 at 6:30 p.m. and CBRT (Calgary) Nov. 12 at 6:30 p.m.

Public lecture November 14

Dr. John L. Dillon

The first Nathaniel H. Grace 75th Anniversary Lectureship in Agriculture will be presented Wednesday, November 14 at 4 p.m. in Lecture Theatre I of the Humanities Centre, University of Alberta.

Internationally renowned agricultural economist Dr. John L. Dillon, head of the Department of Agricultural Economics and Business Management, University of New England, New South Wales, Australia, will discuss "Technology Versus Hunger: Programs and Prospects."

In the morning, Dr. Dillon will attend an informal seminar at the Research Council, Terrace Plaza, when department heads and staff in Biotechnology, Terrain Sciences and Chemistry will discuss their work. University of Alberta staff have been invited to attend.

The Research Council will host a luncheon in Dr. Dillon's honor, followed by a tour of the Campus Building.

Library update

Jennifer Barriskill has returned to the Terrace Plaza library after a six-month leave and is offering interlibrary loan service. Edita Matjesec-Britton has joined the Campus Building library staff, providing clerical support and data entry for the SCITECH on-line catalog.

Devon open house attracts community

Hats off to the Coal Research Department staff!

Along with their colleagues in the Coal Mining Research Centre and the coal research laboratories, CANMET, they held an open house at the new Coal Research Centre, Devon for residents of the Devon community.

More than 350 people from tots to senior citizens turned out to get a first-hand look at what coal research is all about through a slide presentation and tour of the laboratory facilities.

It was a superbly executed effort in co-ordination since the crowd seemed to arrive all at once, and had to be split into groups of about 50-60 for the slide talk, and then broken into groups of approximately 15 for the tours. Research Council staff acted as tour guides through their laboratories, and devised more than one tour route to keep their groups from overcrowding in any one spot.

They were rewarded with the genuine interest of an attentive audience and Devon town councillors expressed their appreciation and pride in having a world-class research centre in their community.

Party plans

It's party time again!

The Research Council's annual Christmas banquet and dance will be held Saturday, December 15 at the Riviera Motor Hotel.

Cocktails will be followed by dinner and an evening of dancing. There also will be a draw of several attractive door prizes.

Tickets will become available in mid-November. Watch for posters with details of ticket prices and where to obtain them.

This annual event is being organized by the representatives of the Alberta Union of Provincial Employees, Local 60, and the Professional Staff Association.

Dr. Duncan Currie, Vice-President of the Frontier Sciences Division, shows off a plaque presented to the Research Council by the Canadian Centre for Creative Technology for outstanding support of the Shad Valley summer program for gifted students. Through industry sponsorships, the program provides students with a work term in a high-tech environment. The Research Council sponsored a student last summer and will sponsor another in 1985.

Annual staff meeting

Keep the morning of December 20 open.

That's the date for the annual staff meeting - time and place to be announced later. Our president, Dr. Robert W. Stewart, will review the year and make a long term service award presentation, and Vic Jackson, Facilities Consultant, will give us an update on Mill Woods.

Employee changes

We wish to welcome to the Research Council: **Gilles Beaulieu**, Research Technologist, Coal Research; **Martha Bor**, Clerk Typist, Oil Sands Research; **Brenda Coulombe**, Clerk Typist, Secretariat; **Myron Oleskiw**, Assistant Research Officer, Atmospheric Sciences.

We wish the following well in new endeavours: **Halcyee Anderson-Pessoa**, Oil Sands Research; **Timothy Freeman**, Chemistry; **Aurie Philipchuk**, Atmospheric Sciences; **Ed Phillipchuk** and **Charles Wood**, Industrial Development.